2017 Coordinated Network Development Plan

for Natural Gas Transmission System Infrastructure in Austria

for the period from 2018 to 2027

Cover page photo: Baumgarten station, metering route 4,
CNDP project: GCA 2015/09 Baumgarten Metering Routes Programme
Photo courtesy: Gas Connect Austria GmbH

Document history

Version	Date	Changes
4.0	11.01.2018	Report for the approval by E-Control Austria after request for amendment by letter from E-Control Austria dated 20.11.2017
3.0	28.11.2017	Report for the approval by E-Control Austria
2.0	31.10.2017	Report for the consultation of E-Control Austria
1.0	05.09.2017	Report for the consultation of the Market Area Manager

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1 Introduction

1.1 Objectives of the Coordinated Network Development Plan

In accordance with the legislation in force since 21 November 2011, the market area manager is obliged to prepare a coordinated network development plan once a year in accordance with section 14 (1) (7) in conjunction with section 63 of the Austrian Gaswirtschaftsgesetz (Natural Gas Act, GWG) in line with the aims of section 63 (4) GWG.

The objectives of the coordinated network development plan are:

- meeting the demand for line capacity to supply consumers while considering emergency scenarios;
- ensuring a high degree of availability of line capacity (security of supply of the infrastructure);
- covering transport needs; and
- complying with the obligation to meet the infrastructure standard according to Article 6 Regulation (EU) No 994/2010

in the market area.

In drawing up the coordinated network development plan, technical and economic expediency, the interests of all market participants and consistency with the Community-wide network development plan and the long-term plan shall be taken into consideration.

1.2 Approach

The 2017 coordinated network development plan covering the period from 2018 to 2027 was prepared in accordance with the provisions of the Network Code on Capacity Allocation Mechanisms (NC CAM), which entered into force on 6 April 2017. In Articles 26-28, the NC CAM lays down the timelines of network development planning as part of the process for the offer of incremental capacities.

In a continuous process all year round, the market participants submit their capacity requirements to the transmission system operators (TSOs). Any and all requirements reported by 1 June 2017 to the TSOs has been included in the 2017 CNDP. See also chapter 4.

As a next step, the market area manager (MAM) established the capacity scenario jointly with the TSOs and coordinated it with E-Control Austria on 14 June 2017.

The TSOs then developed projects on the basis of this capacity scenario that are suitable to meet the demand submitted. The TSOs each submitted their individual network development plans on 11 August 2017 to the MAM. There were five meetings of the MAM and the TSOs in the period from 1 June 2017 to 11 August 2017 to discuss and coordinate the interfaces and projects. The text of the TSOs' network development plans was translated as submitted and incorporated in identical form into chapters 5 and 6 of the present Coordinated Network Development Plan. The projects submitted by the TSOs were translated as submitted and incorporated in identical form in Annex 1, but with a different structure.

The 2017 Coordinated Network Development Plan was presented to the market participants as part of the Austrian Gas Infrastructure Development Days on 5 September 2017.

Consultation of the 2017 Coordinated Network Development Plan by AGGM (CNDP 2017 Version 1.0) was scheduled for the period from 7 September 2017 to 2 October 2017. The 2017 Coordinated Network Development Plan was published on AGGM's website.

The statements were appreciated accordingly.

On 31 October 2017 the Coordinated Network Development Plan (Version 2.0) was sent to E-Control Austria by AGGM. E-Control Austria consulted the CNDP 2017 in the period from 3.11.2017 to 20.11.2017.

On 23 November 2017 the final coordination took place between E-Control Austria, Gas Connect Austria GmbH and Trans Austria Gasleitung GmbH and AGGM.

This version of CNDP 2017 is the basis for the approval of the transmission system operators.

The coordinated network development plan covers the Austrian transmission systems in the Eastern market area. The Tyrol and Vorarlberg market areas are not included in the CNDP because there are no transmission systems in those market areas.

There was a major change in the planning process this year as the role of the market area manager was transferred from Gas Connect Austria GmbH to AGGM Austrian Gas Grid Management AG on 1 June 2017.

2 Facts and figures about the Austrian transmission system

2.1 Present gas infrastructure

Number of transmission system operators:	2
Total length of transmission grids:	approx. 1,690 km
Total compressor power:	626 MW
Virtual trading point:	CEGH (www.cegh.at)

2.2 Natural gas demand in the Eastern market area

Historical annual demand for gas in the Eastern market area (end users)

2016:	82,157 GWh (source: AGGM)
2015:	78,631 GWh (source: AGGM)
2014:	73,330 GWh (source: AGGM)

2.3 Transmission system operators in the Eastern market area

Transmission system operator Gas Connect Austria GmbH

Website: www.gasconnect.at

Neighbouring transmission system operators:
- Baumgarten GCA/WAG: eustream, a.s.
- Oberkappel: Open Grid Europe GmbH, GRTgaz Deutschland GmbH
- Überackern ABG: bayernets GmbH
- Überackern SUDAL: bayernets GmbH
- Petrzalka: eustream a.s.
- Mosonmagyaróvár: FGSZ Ltd
- Murfeld: Plinovodi d.o.o

Physical entry points:
- Baumgarten GCA (border to Slovakia)
- Baumgarten WAG (border to Slovakia)
- Überackern ABG (border to Germany)
- Überackern SUDAL (border to Germany)
- Storage Point 7Fields
- Oberkappel (border to Germany)
- MAB/WAG storage point

Physical exit points:
- Mosonmagyaróvár (border to Hungary)
- Überackern ABG (border to Germany)
- Überackern SUDAL (border to Germany)
- Murfeld (border to Slovenia)
- Petrzalka (border to Slovakia)
- Storage Point 7Fields
- Baumgarten WAG (border to Slovakia)
- Oberkappel (border to Germany)
- MAB/WAG storage point

Non-physical entry points:
- Mosonmagyaróvár (border to Hungary)
- Murfeld (border to Slovenia)
- Petrzalka (border to Slovakia)

Total length of transmission grid: 554.2 km

Total compressor power 146 MW

Total energy transported (gas)
- 2016: 189,925 GWh
- 2015: 135,165 GWh
- 2014: 165,291 GWh

Transmission system operator Trans Austria Gasleitung GmbH

Website: www.taggmbh.at

TAG GmbH is a company governed by Austrian law. In its capacity as a TSO it is responsible both for transit and for supply of the Austrian market and network development. Snam S.p.A. (84.47%) and Gas Connect Austria GmbH (15.53%) are the owners of TAG GmbH.

The TAG pipeline system extending from the Austrian-Slovak to the Austrian-Italian border is described below. The TAG system is connected to the SOL system at Weitendorf, this way enabling the transport of gas in the direction of Slovenia and on to Croatia. The Austrian market is supplied by ten physical exit points.

The system can be operated physically in both direct and reverse flow.

Neighbouring TSOs:

- Baumgarten TAG: eustream a.s.
- Tarvisio/Arnoldstein: Snam Rete Gas S.p.A.

Physical entry points:

- Baumgarten TAG (border to Slovakia)
- Arnoldstein (border to Italy)

Physical exit points:

- Arnoldstein (border to Italy)

Non-physical exit points:

- Baumgarten (border to Slovakia)

Total length of transmission grid:
3 pipelines with 380 km each, approximately 1,140 km in total

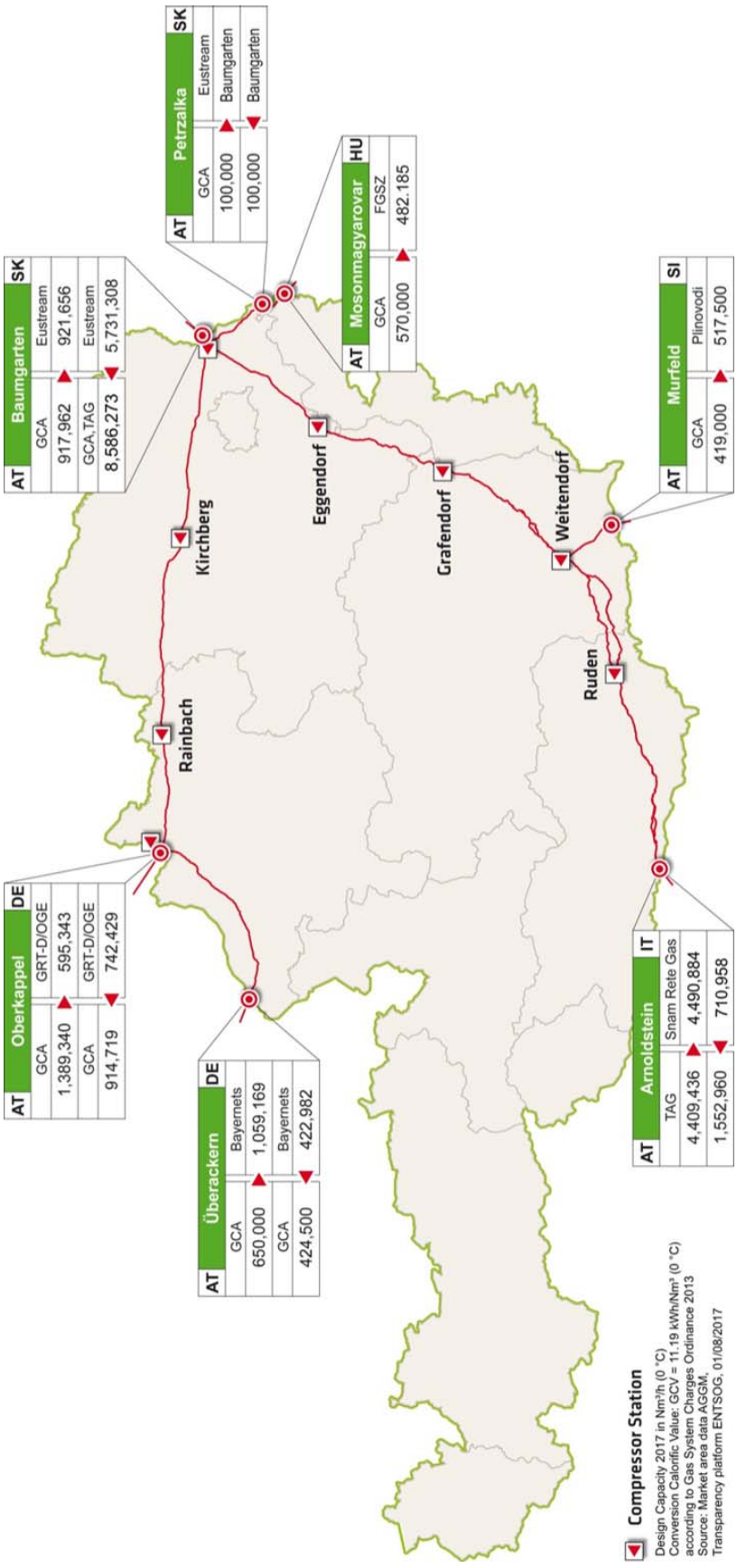
Total compressor power
5 compressor stations, approximately 480 MW ISO

Total energy transported (gas)

- 2016: 337,911 GWh
- 2015: 347,092 GWh

2.4 Technical capacities

Table 1: Technical capacity at relevant interconnection points in the Eastern market area.



Source: GCA, TAG, AGGM; 2017

2.5 Infrastructure standard

According to the infrastructure standard, the capacity in the observation area (Eastern market area in Austria) must be able to meet very high demand even in the case of an outage of the largest infrastructure facility (Baumgarten).

2.5.1 Infrastructure standard calculated according to regulation (EU) 994/2010

In cooperation with the transmission system operators, AGGM has calculated the infrastructure standard according to Article 6 of the VO (EU) 994/2010 valid until 30 October 2017 for the market area East.

Table 2: Calculation of the Infrastructure standard according regulation (EU) No 994/2010

Anlagenbezeichnung	Technische Kapazität (Mio. Nm³/d)	Definition, Erkläuterungen, Quellenangabe
Epm	**276,35**	technische Kapazität von Einspeisepunkten
Baumgarten (GCA, WAG, TAG)	206,07	technische Kapazität (www.aggm.at, Marktgebietsdaten, 1.8.2017; Originaldaten werden von GCA und TAG übermittelt Brennwert: 11,19 kWh/Nm³)
Oberkappel	21,95	
Überackern	10,19	
Arnoldstein	37,27	
Freilassing&Laa/ Thaya	0,87	techn. verfügbare Kapazität, dzt nicht gebucht (Quelle: AGGM, 01.08.2017)
Pm	**3,57**	max. Technische Produktionskapazität
Produktion OMV	3,03	gebuchte Standardkapazität (Quelle: AGGM, 01.08.2017)
Produktion RAG	0,54	gebuchte Standardkapazität (Quelle: AGGM, 01.08.2017)
Sm	**44,54**	maximale technische Ausspeisekapazität
Speicher OMV	26,55	gebuchte Standardkapazität (Quelle: AGGM, 01.08.2017)
Speicher RAG ES	13,31	gebuchte Standardkapazität (Quelle: AGGM, 01.08.2017)
7Fields FL	-	bereits am Punkt Überackern inkludiert
7Fields VG	4,68	gebuchte Standardkapazität (Quelle: AGGM, 01.08.2017)
Haidach VG	0	dz. keine Verbindung
LNGm	**0**	Liquified Natural Gas, für Österreich irrelevant
Im	**206,07**	Technische Kapazität der größten einzelnen Gasinfrastruktur, im Falle Österreichs: Baumgarten
Dmax	**51,90**	Gesamte tägliche Gasnachfrage im analysierten Gebiet während eines Tages bei hoher Nachfrage, mit statistischer Wahrscheinlichkeit alle 20 Jahre, Februar 2012 (Quelle: AGGM)
N - 1 [%]	**228%**	

Source: AGGM, GCA, TAG; 2017

For the market area East, the result of the (N-1) formula is 228%. This result shows that the gas supply in the market area East meets the requirement of > 100% according to Regulation (EU) No. 994/2010. In 2013, the result of the N-1 formula was 233%, in 2014 it was 235%, in 2015 it was 237% and in 2016 it was 233%.

The slight reduction of 5 percentage points compared to 2016 is caused by the discontinuation of the Thann storage facility and the reduction in domestic production.

2.5.2 Infrastructure standard calculated according to regulation (EU) 2017/1937

In addition, the infrastructure standard has been calculated in accordance with the Regulation (EU) 2017/1938, the Regulation concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No 994/2010, which is in force since 1 November 2017.

The formula for the calculation of the infrastructure standard has basically remained the same, but the new regulation has made some clarifications concerning the definition of the parameters to be used.

The new regulation also states that the parameters used must be clearly described and the values used must be justified.

Table 3: Calculation of the Infrastructure standard according regulation (EU) No 2017/1938

Name of facility	Technical capacity (million Nm³/d)	Definition, notes, source
Epm	**163,16**	
Baumgarten (GCA, WAG, TAG)	140,34	Exit Slowakia
Oberkappel	21,95	Minimum of Exit NCG und WAG capacity OK-->BM
Überackern	-	integrated in Oberkappel
Arnoldstein	-	competition with Passo Gries, herfore zero
Freilassing&Laa/ Thaya	0,87	techn. available capacity (source: AGGM, 1 August 2017)
Pm	**3,57**	
Produktion OMV	3,03	Standard capacity booked (source: AGGM, 1 August 2017)
Produktion RAG	0,54	Standard capacity booked (source: AGGM, 1 August 2017)
Sm	**42,04**	
Speicher OMV	23,36	at a working gas volume of 30%
Speicher RAG ES	15,11	at a working gas volume of 30%
7Fields FL	-	
7Fields VG	3,56	at a working gas volume of 30%
Haidach VG	0	
LNGm	**0**	
Im	**140,34**	
Dmax	**53,14**	Baseline Szenario Maximum of he nect 10 years
N - 1 [%]	**129%**	

Source: AGGM; 2017

The value reduced in comparison to the calculation according to the actual SoS VO so far applies both the situation at the border crossing points as well as the storage development in the real winter course and is therefore in a total view a basis for the necessary work on the corresponding documents due to the new SoS VO.

Description and justification of the parameters

Calculated Area:

In accordance with the provisions of the national Austrian preventive action plan (version 3, December 2016) the infrastructure standard is calculated for the Austrian market area East.

"D_{max}" total daily gas demand:

Regulation (EC) 2017/1938 Annex II (2) defines the parameter "Dmax", in Article 5 of Regulation (EC) 2017/1938 the addition is made with regard to the development of natural gas consumption and the long term effects of energy efficiency measures.

The up to date maximum historical daily gas demand occurred in February 2012. On the gasday 10.2.2012 51.9 million Nm³ was consumed in the market area East. In the electricity-generating power stations, 16.38 million Nm³ were consumed on this day, with the power plants not running at full load during the entire day. At 24 hours full load operation of the power plants a power plant consumption of 19.94 million Nm³ would have been recorded. This would have resulted in a daily gas demand of 55.46 million Nm³. Therefore, a higher consumption is also possible with a corresponding demand situation.

Long-term planning 2017 describes three gas demand scenarios. The minimum scenario, the baseline scenario and the maximum scenario, with the baseline scenario having the highest probability of occurrence. The minimum scenario assumes an aliquoted implementation of the energy efficiency guideline (energy savings are the same for all primary energy sources). As described in chapter 2.3.1.4 and chapter 2.3.1.5. of long-term planning 2017, however, there is no clear trend towards a reduction in gas sales.

The baseline scenario of the LFP 2017 is therefore used as the basis for the determination of D_{max} and the 10-year planning period (2018-2027) is also assumed. The baseline scenario assumes a slight increase in the maximum possible hourly demand until 2022, followed by a slight reduction. According to this slight increase in the maximum hourly demand, a total daily gas demand of 53.14 million Nm³ is possible in 2020 and is therefore used in the calculation of the infrastructure standard for D_{max}.

Dieser Wert ist durchaus realistisch, da der Wert unter dem maximalen historischen Gasabsatz bei Annahme eines 24h Volllast Kraftwerkbetriebes liegt.

This value is quite realistic since the value is below the maximum historical gas consumption assuming a 24h full-load power plant operation.

"EP_m" technical capacity of entry points

Technical capacity is defined in detail in VO (EU) 2017/1938 by referring to VO (EU) 715/2009. As the technical capacity the firm capacity is defined. The definition of technical capacity also states "taking into account network integrity", which suggests that the smaller value of entry and exit capacity is to be set at a network connection point.

Article 5 (1) of the new Regulation states that the infrastructure standard must also take the utilization rates of the existing infrastructure into account. This also indicates that the actually usable capacities have to be taken into account, so the above-described procedure has been chosen at interconnection points.

For the entry point Baumgarten, the smaller value of the technical capacity is taken from Exit Slovakia and Entry Austria. The eustream has a technical exit capacity of 140.34 million Nm³/d (source: www.transparency.entsog.eu). The Austrian transmission system operators GCA GmbH and TAG GmbH have a total technical entry capacity of 206.07 million Nm³ / d. The smaller value is set for the new calculation as explained above, which is technically quite understandable since the higher entry capacity in Austria can not be fully used.

Oberkappel und Überackern are marketed competitively, i.e. that either the entry capacity can be booked in Oberkappel or in Überackern. The sum of the entry capacities from the MA NCG is greater than the technical capacity of the WAG from Oberkappel towards Baumgarten. If the gas is to be transported to the end customer in MA East, the capacity of the WAG from Oberkappel towards Baumgaren is the limiting factor. For this reason, the maximum capacity of the WAG is set for the entry points Oberkappel and Überackern, including the storage 7 fields. Therefore, the above-mentioned 21.95 million Nm³/d has taken into account.

SNAM markets a firm capacity of 17.08 million Nm³/d from the gas year 2018 on competitively between Exit Tarvisio and Exit Passo Gries (IT - CH). In the case of a Europe-wide bottleneck, in the worst case it can therefore be assumed that there is no capacity for Austria at Tarvisio. For this reason, the technical capacity at the Entry Point Arnoldstein is set to zero.

Freilassing & Laa an der Thaya: At the interconnection points in the distribution area, Freilassing and Laa / Thaya, the reported standard capacity is assumed.

"P_m" maximal technical production capability

The booked standard capacity was set for the maximum technical production capacity. The actual maximum hourly production rate from GY 2017 will reach the level of the booked standard capacity (total of 3.61 million Nm³/d).

"S_m": maximal technical storage deliverability

In VO 2017/1938, there are several indications which require consideration of the working gas volume when determining the maximum technical withdrawal capacity.

For the MA East, it is assumed that the coldest day can occur until the end of February. The working gas volume of the Austrian storage facilities in the years 2014 to 2017 by end of February was 22% to 38%. In the determination of the maximum technical withdrawal capacity an average value of 30% working gas volume is assumed. This percentage is also given in the specifications of the new SoS VO. Since the withdrawal capacity changes as a function of the working gas volume, this factor must be taken into account when calculating the N-1 value. The published withdrawal curve was set for each storage facility. Based on the above data the maximal technical daily withdrawal capacity is 42.04 mNm³/d.

For the calculation of the maximal technical storage deliverability the technical withdrawal capacity is used and not only the marketed withdrawal capacity

The use of a lower working gas volume does not appear to be appropriate, since in the case of storage management, efforts should be made to obtain proper working gas volume and thus withdrawal rate as far as possible until the end of the winter period.

"LNG_m": maximal technical LNG facility capacity

Has no relevance for Austria

"I_m": means the technical capacity of the single largest gas infrastructure

This is for the MA East Baumgarten, therefore, this value is deducted accordingly in the calculation of the infrastructure standard.

2.5.3 Interpretation of the results

According to the SoS regulation 2017/1938, an infrastructure standard of 129% is to be reported for MG Ost. This value is significantly lower than the infrastructure standard calculated according regulation 994/2010.

3 reasons are responsible:

- The technical capacity of the entry points was not formally negotiated, but also the hydraulic feasibility was considered - which ensures a much higher reality reference.
- In the case of the technical exit capacity of the storage facilities, the storage level was taken into account, which means that a slightly lower capacity is available.
- The total daily gas demand was recalculated for the 10-year planning horizon and slightly increased.

In summary, it is stated that the infrastructure standard calculated according to VO 2017/1938 has a much higher reality reference than the infrastructure standard calculated so far.

An infrastructure standard with 129% reflects a good security of supply with regard to the infrastructure. Projects that additionally support the integration with the neighboring countries are to be evaluated positively for the further improvement of security of supply.

3 Planning horizon for the 2017 Coordinated Network Development Plan

3.1 Ten-Year Network Development Plan

One of the key tasks of the European Network of Transmission System Operators for Gas (ENTSOG) is to prepare the Community-wide Ten-Year Network Development Plan (TYNDP) which has a planning horizon of (at least) ten years and has to be revised every other year. The TYNDP provides a picture of the European gas infrastructure and, in particular, comprises detailed information on various development scenarios, market integration and security of supply, in this way reflecting the overall dynamics of the European gas market. The predominant objective of the TYNDP is, however, to provide modelling of the integrated gas network in order to be able to identify future investment gaps in a timely manner, particularly with respect to cross-border capacities. Pursuant to Regulation (EC) No 715/2009, the Agency for the Cooperation of Energy Regulators (ACER) reviews the national ten-year network development plans to assess their consistency with the TYNDP and, in the case of inconsistencies, recommends amendments to the national ten-year network development plan as appropriate.

In view of the ambitious climate targets to be achieved by 2030, ENTSOG for the first time set the planning horizon at twenty years in the 2017 TYNDP. In order to model demand, ENTSOG examined four different consumption evolution scenarios, taking into account a large number of general parameters such as the overall economy and achieving the climate targets as well as specific parameters such as the future role of natural gas in heating, power generation and in the transport sector. Only one of the four scenarios is based on growing demand for natural gas by 2030, caused primarily by the increased use of natural gas in the transport sector and for power generation based on regulatory requirements. With regard to the gas infrastructure in Europe, which has to be the basis for a functioning internal market, ENTSOG concludes in the 2017 TYNDP that - as many projects are in an advanced phase – supply is no longer the key issue and that the focus is on maintaining diversity among the producers and suppliers. Although the reduced production of the Groningen field and the German L-gas fields, which will become noticeable in the next few years, can be compensated for by additional pipeline gas from Russia and LNG supply sources, the diversification of supply will not be able to be maintained. From this point of view, it will be necessary to promote the promising conventional gas production in Cyprus and the Black Sea region (ROHUAT project); ENTSOG also mentions biogas production in this context as a factor contributing to the diversification of supply. After discussing the infrastructure, however, ENTSOG concludes that the present system is able to cope even with the highest-demand scenario, and even in the case of peak consumption.

Up to the 2013 edition, the European network development plans covered particularly the cross-border points, the related capacity requirements, an overview of the planned gas infrastructure, various consumption and sales scenarios and flexibility assessments of the European Member States in various congestion scenarios. With the preparation of the 2015 TYNDP, the European network development planning included for the first time projects that are candidates for inclusion on the Union list of PCIs. Pursuant to Regulation (EU) No 347/2013, the TYNDP 2015 was enlarged to include an energy system-wide cost-benefit analysis. It aims to divide potential candidates for inclusion on the next Union list into three categories: The 2017 TYNDP retains this approach and introduces a new project category in order to differentiate more clearly between projects that are “advanced” and projects that are “less advanced”:

- Projects with a final investment decision
- Projects (advanced) without a final investment decision
- Projects (less advanced) without a final investment decision
- Projects that are already PCIs

In the TYNDP 2017, similarly to the TYNDP 2015, the project categories are analysed in terms of their direct and indirect benefit in the different sales, consumption and congestion scenarios. The analysed scenarios and assumptions are based on the energy system-wide cost-benefit analysis undertaken by ENTSOG. In order to conclude application for the next Union list, the projects contained in the TYNDP 2017 were merged into project groups at the request of the European Commission. In conjunction with the project-specific cost-benefit analysis, the direct and indirect benefit of the individual project groups for European Member States was presented and rated in the various demand, consumption and congestion scenarios. The following table shows the Austrian projects that are part of the 2017 TYNDP (see also link for more detailed information)

Table 4: TYNDP 2017 Projects focused on Austria

TYNDP Project-number	Project name	Status in TYNDP 2017	Projects KNEP 2017	2. PCI list
TRA-N-954	TAG Reverse Flow	less-advanced, non-FID	TAG 2016/01 TAG 2016/03	No
TRA-N-361	GCA 2015/08: Entry/Exit Murfeld	advanced, non-FID	GCA 2015/08	Yes, 6.24.4
TRA-N-021	Bidirectional Austrian-Czech Interconnector (BACI, formerly LBL project)	advanced, non-FID	GCA 2015/01a	Yes, 6.4
TRA-N-423	GCA Mosonmagyaróvár	advanced, non-FID	GCA 2015/05	Yes, 6.24.3
TRA-N-801	Břeclav-Baumgarten Interconnection (BBI) AT	advanced, non-FID	GCA 2016/01	No

Source: TYNDP 2017

The TRA-N-954 project included in the TYNDP is a project of the TSO TAG GmbH. The project goal is to enable physical transport capacities of at least 11,190,000 kWh/h in reverse flow from Italy to Slovakia. This project, together with the TAG 2016/01 project (TAG Reverse Flow Weitendorf/Eggendorf) and TAG 2016/03 (Reverse Flow Baumgarten MT Station (MS2)), aims to improve local security of supply through diversification of supply routes and sources of supply and the enhanced access from Italy that this will produce. By enabling additional possibilities for physical reverse flow to be offered in the south-north and south-east directions, this project will foster the north-south-east corridor and as such is of interest for the Austrian market area.

3.2 2016 Network Development Plan Gas - Germany

Developing the German Gas Network Development Plan has been a major concern for the Vereinigung der Fernleitungsnetzbetreiber Gas e.V. (FNB Gas), the association of German TSOs, since its establishment in 2012. The German NDP was initially prepared annually, and since 2016 has been produced biannually in close coordination with the Bundesnetzagentur, the German regulatory authority in the energy sector, with the aim of identifying future transport capacity needs for natural gas. The requirements for the network development plan are stipulated in the German Energiewirtschaftsgesetz (Energy Act, EnWG) and in the EU-wide network development plan; accordingly, the planning horizon is ten years. The individual plans of the TSOs are discussed and modified in a number of consultation and revision cycles, incorporated into a first draft of a scenario framework and developed in the course of nine phases into the final network development plan.

The scenario framework document, which is developed on behalf of the TSOs, constitutes the overall basis for the network development plan. It specifies theoretical assumptions on the development of production, supply and consumption of natural gas and the cooperation with other countries in the next ten years. In line with the Community-wide network development plan, reference to the planning of electricity transmission system operators is also made in this phase. The scenario then needs to be approved by the Bundesnetzagentur, after which the TSOs develop a plan for the German transmission network including all measures required to maintain safe and reliable grid operation which is capable of meeting demand. After a consultation phase and any necessary adjustments, the Bundesnetzagentur finally acknowledges and approves the network development plan and publishes it.

The most significant measure for Austria in the German 2016-2026 NDP is the Monaco 1 project. The MONACO 1 project is the first part of a larger project consisting of MONACO 1, MONACO 1 und SEL:

- MONACO 1 Burghausen – Finsing final investment decision
- MONACO 2 Finsing – Amerding no final investment decision
- SEL Amerding – Mannheim region no final investment decision

Besides strengthening security of supply in the southern part of Germany SEL has the potential to strengthen the transit capacity towards Austria. Moreover, through the commissioning of the first section of MONACO 1 the diversification of transit routes is strengthened and the market participants will have further possibilities for gas transport among the VTPs NCG and CEGH. In addition, by expanding the cross-border capacities accordingly, the potential storages in the border area between Germany and Austria in the area of Überackern could make a further contribution to the strengthening of security of supply.

3.3 2017 long-term planning

Alongside the CNDP, AGGM prepares the long-term planning (LTP) for the natural gas distribution network infrastructure in Austria.

The overall objective of the LTP is to ensure the transport capacities in the distribution area that are required to supply consumers and meet the transport needs of storage facilities and producers.

Consumer demand is analysed using three demand scenarios: to this end, two different evolution scenarios of the performance of gas-fired power stations and two different scenarios of consumer behaviour were combined.

Each of the three demand scenarios is described in terms of the maximum possible hourly flow rate on the one hand and expected annual demand (with a winter with approx. 3000 heating degree days) on the other. The maximum possible hourly flow rate is used as the design basis for distribution network infrastructure. This means that infrastructure must be designed in such way that it can transport the maximum possible hourly flow rate safely.

Chart 1: Demand scenarios in the distribution area

		Entwicklung der Gaskraftwerksleistung	
		Stagnation auf Status Quo 5/2017	Berücksichtigung aller von den Netzbetreibern bekanntgegebenen Bedarfe
Entwicklung der sonstigen Endkunden	Berücksichtigung der von den Netzbetreibern genannten künftigen Veränderungen.	**Baseline Szenario**	**Maximal Szenario**
	Berücksichtigung der von den Netzbetreibern genannten künftigen Veränderungen. Zusätzliche Reduktion des Absatzes von 1,5% pa.	**Minimal Szenario**	

Source: AGGM; 2017

Peak demand in the Eastern distribution area was measured at 2,386 kNm³/h in February 2012. This high demand was due both to a prolonged cold spell and high levels of electricity generation. Demand was at a similarly high level in January 2017 (clearing values: 2,233 kNm³/h). The demand scenarios considered in the LTP 2017 are based on this historical peak demand value recorded in February 2012.

Diagram 1 shows actual hourly flow rates and development of the maximum hourly flow rate in the eastern distribution area over the period from 2003 to 2027. The chart shows future maximum hourly flow rates for the three scenarios defined.

The actual flow rates and future maximum possible hourly flow rates shown in Diagram 1 were determined using different approaches. The actual flow rates shown reflect the historical simultaneous gas demand measured in the distribution area (VG_MAX). The future maximum

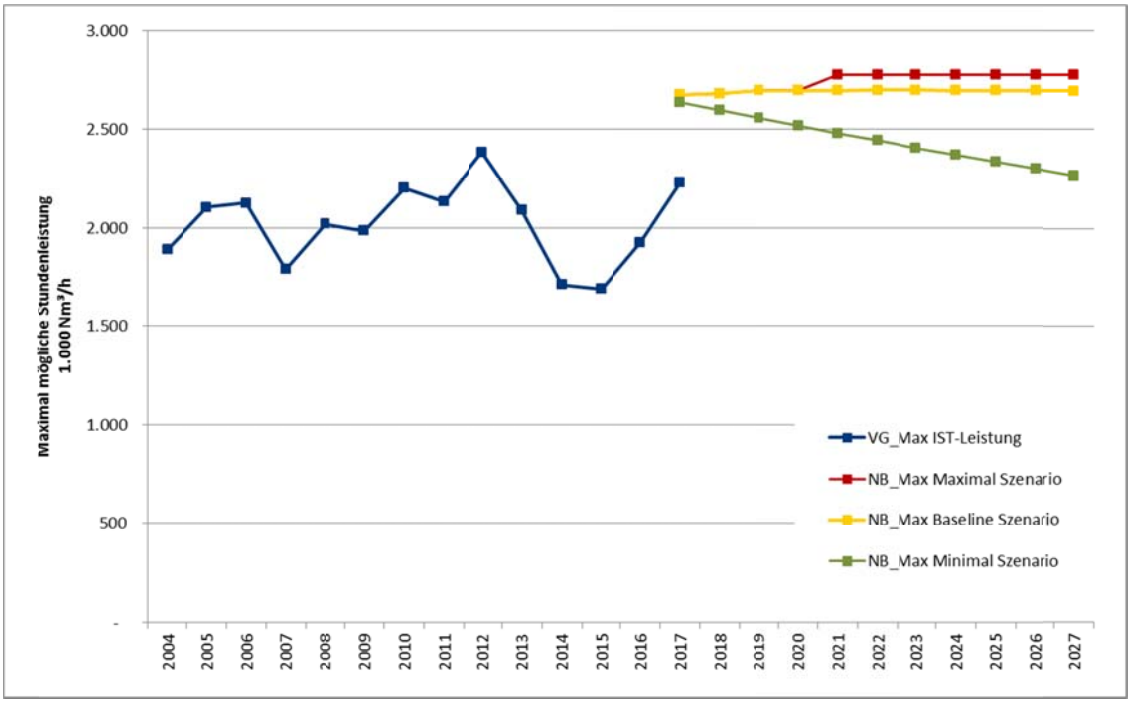
possible hourly flow rates reflect the maximum expected simultaneous demand, comprising the total maximum expected flow rates for each distribution area (NB_MAX).

The NB_MAX value for maximum possible hourly flow rate is used in hydraulic calculations for grid design across the entire distribution network.

The maximum possible hourly flow rate in the maximum scenario is closer to the baseline scenario in the 2017 LTP. This is because only one additional gas-fired power station is included in the maximum scenario in the 2017 LTP.

Overall, the network operators assume that the maximum possible hourly flow rate will stagnate over the next ten years.

Diagram 1: Demand scenarios, maximum capacity/hour, Eastern market area



Source: AGGM; 2017

The additional demand of the distribution area is also taken into account in the transmission system market survey. On behalf of the distribution system,

- the demand for an additional 600,000 Nm³/h from the primary distribution system PVS2→ to PVS1, which is already in the process of being realised,
- an additional demand on Penta West in the Andorf region

were submitted in the 2017 CNDP.

3.4 PCI projects - focus Austria

Background

With the aim of achieving the common European goals, network development projects identified as being significant at national level are marked as projects of common interest (PCIs). They close infrastructural gaps on the way to accomplishing an integrated natural gas and electricity market in the EU and, by putting emphasis on the development of renewable energy, are an important factor in achieving climate protection targets. In order to be awarded PCI status, a project needs to have a significant impact on the energy markets and market integration in at least two EU countries, boost competition on energy markets, and help the EU's energy security by diversifying sources. It also needs to contribute to the EU's climate and energy goals by integrating renewables. The list of regional PCIs is finalised - following compilation and assessment by various stakeholders - by the Member States and the EU Commission. The Commission then adopts the list of approved PCIs via a delegated act procedure. The first list of PCIs was published in 2013 and the second in 2015. The list is updated every two years, i.e. the next update will take place in autumn of 2017.

Projects with the status of PCIs benefit from accelerated planning and permit procedures, lower administrative costs, increased public participation and enhanced funding options. PCI status is a prerequisite to apply for co-funding, which is decided upon in a separate procedure. Finally, a single national authority is responsible for obtaining permits.

PCIs involving Austria

In the second PCI list (COMMISSION DELEGATED REGULATION (EU) 2016/89) the section on Priority Corridor North-South Gas Interconnections in Central Eastern and South Eastern Europe (NSI East Gas) lists the following projects, which are directly related to the infrastructure in Austria:

6.4 PCI Bidirectional Austrian — Czech interconnection (BACI) between Baumgarten (AT) — Reinthal (CZ/AT) — Brečlav (CZ)

6.24 Cluster for the phased capacity increase on the Bulgaria — Romania — Hungary — Austria bidirectional transmission corridor (currently known as ROHUAT/BRUA) to enable 1.75 bcm/a in the first phase and 4.4 bcm/a in the second phase, including new resources from the Black Sea. [...]

> 6.24.3 GCA Mosonmagyarovar CS (development on the Austrian side) (1st phase)
>
> [...]

6.25 Cluster infrastructure to bring new gas to the Central and South-Eastern European region with the aim of diversification, including one or more of the following PCIs: [...]

> 6.25.2 Pipeline system from Greece to Austria [currently known as Tesla]
>
> 6.25.3 Further enlargement of the Bulgaria — Romania — Hungary — Austria bidirectional transmission corridor [currently known as ROHUAT/BRUA, phase 3]
>
> [...]

6.26 Croatia — Slovenia — Austria cluster at Rogatec, including the following PCIs: [...]

6.26.4 GCA 2014/04 Murfeld (AT)

6.26.5 Upgrade of Murfeld/Ceršak interconnection (AT-SI)

[...]

Bidirectional Austrian — Czech interconnection (BACI)

The BACI project connects the transmission system of Gas Connect Austria GmbH in Austria with that of NET4GAS, s.r.o. in the Czech Republic. The total length of the pipeline is 61 km, 12 km of which are located on Czech territory (from the Břeclav compressor station to the Austrian border) and 49 km are on Austrian territory (from the Czech border to Baumgarten). While daily bidirectional capacity is 201.4 GWh according to the 2017 TYNDP, NET4GAS indicates DN 800 (PN 84) on its website. In the second PCI list (Technical information on Projects of Common Interest) the date of commissioning is given as 2019 for the pipeline, which crosses the Czech-Austrian border near Reintal in Austria; the TYNDP indicates that commissioning will take place in 2020. This project will create fully new transport capacities for the Austrian and Czech markets and their virtual trading points. Alongside the increased market integration to be achieved by this project, the interconnection concepts for the two markets and the resulting flexibility for system users, BACI is a significant component in implementing the North-South Corridor. See also chapter 5.7.2.

ROHUAT

Upon successful implementation, the ROHUAT project will enable natural gas transports from the Black Sea to the Baumgarten hub. The new corridor will be planned and implemented as a bidirectional corridor from the very beginning. The gas volumes to be transported are primarily new gas from storage facilities in the Black Sea yet to be developed in the framework of an upstream initiative, where the licence holders for exploration and production include OMV, Petrom, Exxon Mobil and Lukoil. As indicated in the project name, the pipeline crosses Romania, Hungary and Austria. The project will be implemented by building new facilities, but also by using existing pipelines and by increasing capacity at relevant points. Project 6.24.3 of the TSO Gas Connect Austria GmbH, for example, can be seen as a sub-project of ROHUAT, with the objective of enabling reverse flow at the Mosonmagyarovar cross-border interconnection point. Annual transport volume after overall completion of the project is assumed to be approx. 4.4 billion m^3. See also chapter 5.7.3.

TESLA

Project 6.25 “Cluster infrastructure to bring new gas to the Central and South-Eastern European region, including one or more of the following PCIs” is located in southeast Europe and aims to promote diversification of the sources. Project 6.25.2 Tesla is intended to bring gas from Turkey via Greece, Macedonia, Serbia and Hungary to Baumgarten and thus Austria. The TYNDP was retrospectively reopened on request by the European Commission to enable the Tesla project to replace the cancelled South Stream project. In line with the Union list of Projects of Common Interest (PCI), the Tesla project provides for pipeline erection up to the Austro-Hungarian border. Accordingly, there are no plans on behalf of GCA for an associated project in the Austrian market area.

Cluster Croatia — Slovenia — Austria

Projects 6.26 Cluster Croatia – Slovenia – Austria are located in Austria, Slovenia and Croatia. The objective is to bring new sources for natural gas to the Austrian market and to increase capacity at the relevant cross-border points. The LNG terminal in Krk or natural gas volumes from Azerbaijan could be potential new sources. The projects increase security of supply in the above-mentioned countries as a consequence of the elevated transport capacity and lead to a further diversification of transport routes for natural gas in Europe. Sub-project 6.26.4 "GCA 2014/04 Murfeld (AT)" prepared by the TSO GCA was submitted for inclusion in May 2015 and accorded PCI status in November 2015. See also chapter 5.7.5

3.5 Market demand assessment report

In line with the provisions of the NC CAM, the Austrian TSOs prepared a market demand assessment report for each market area boundary in collaboration with the TSOs in the neighbouring countries on the basis of the preceding capacity demand survey. These reports have been published on the websites of the TSOs.

The reports comprise the capacity requirements described in chapter 4.

3.6 Security of supply: gas-powered vs. electric compressors

In the official decision approving the 2016 CNDP of 23 September 2016, the authority imposed requirement 2c. According to this, the market area manager and the transmission system operators are required to prepare a study analysing the effects of electrical compressor and gas-powered compressor performance on the security of supply in the Austrian market.

Since a study of this kind, and in particular a blackout study, can turn out to be very comprehensive, an agreement was made with ECA to examine a specific scenario.

The following scenario was examined:

- The entire power supply to Baumgarten is interrupted for 3 days
  - Operation of the station is enabled by emergency power supply
  - All electric compressors are inoperable
- Increased seasonal demand in winter (2.4 million Nm³/h) in the distribution area (DA)
  - Supply from DA:
    - 130,000 Nm³/h from production 6%
    - 1,400,000 Nm³/h from storage 58%
    - 870,000 Nm³/h from transmission system 36%
- The status quo infrastructure is examined
- Questions:
  - What are the freely allocable capacities available at the relevant points?
  - Can the supply of all consumers be ensured? Where does congestion occur?

AGGM simulated the specified scenario in the distribution area and identified the required volumes and pressures at the interconnection points to the transmission network. The TSOs simulated their pipelines using these input parameters and identified the restrictions which would possibly be necessary at the relevant points.

Outcome

The distribution area can be supplied without restrictions.

No restrictions will occur at the relevant points in the TAG GmbH system.

No restrictions will occur at the relevant points in the GCA system in the case of west-east flow direction on the WAG line. In cases of maximum east-west flow on the WAG line, reductions totalling 120,000 Nm³/h are necessary at the Oberkappel and/or Überackern exit points.

3.7 Projects reported in the 2016 CNDP that were completed

The projects listed in Table 5 were approved in the 2015 CNDP and 2016 CNDP and implemented during the last planning period. These projects are not contained in the 2017 CNDP.

Table 5: Projects implemented during the last planning period (from 8/1016 to 8/2017)

Projectsponsor	Projectnumber	Projectname
GCA	2015/09	Baumgarten Metering Routes Programme
GCA	2016/E6	Baumgarten BOP 13, HAG, MAB Blow-Off System
GCA	2016/E3	Baumgarten MS3, Replacement of Low-Voltage Installation
TAG	2015/01	Messstrecken Baumgarten TAG Einbindung
TAG	2015/03	US Flow Meters ARN-BMGT

Source: GCA, TAG, AGGM; 2017

3.8 Withdrawn projects

The projects listed in Table 6 have been approved in the 2015 CNDP and 2016 CNDP and will be withdrawn, as these projects are no longer required to cover the capacity requirements declared in the 2017 CNDP. These projects are not contained in the 2017 CNDP.

Table 6: Withdrawn projects

Project-sponsor	Project-typ*)	Poject-number	Projectname	Implementation time frame [years]	Planned completition [date]
withdrawn projects					
GCA	IC	2015/06	Mosonmagyaróvár plus		
GCA	IC	2016/01	Baumgarten Brezlav Interconnector		Q4 2021
GCA	IC	2016/02	Oberkappel N4G Interkonnektor		Q1 2022
GCA	IC	2016/03	Entry/Exit Murfeld & Entry Arnoldstein		Q4 2021
TAG	IC	2016/06	TAG Baumgarten interconnection capacity (BBI)		

*) IC - Project for incremental capacities; R - replacement investment project

Source: GCA, TAG, AGGM; 2017

4 Capacity demand

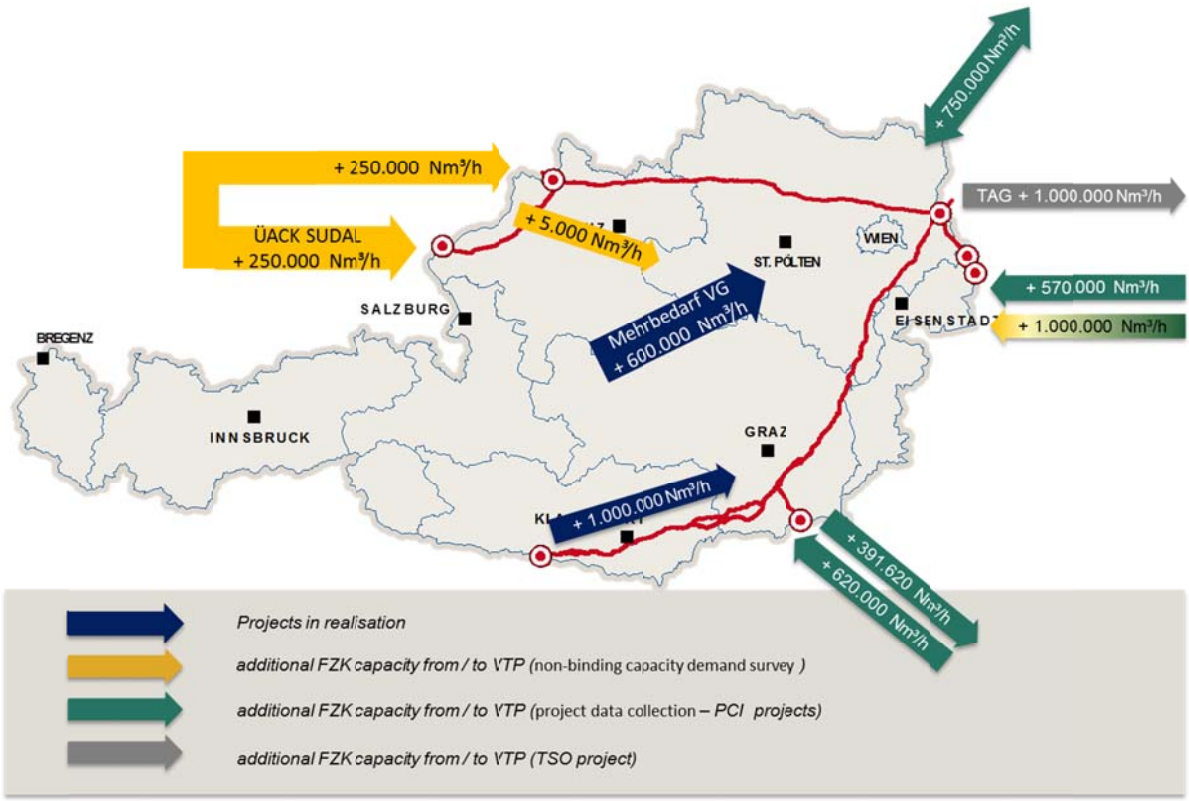
4.1 Capacity demand and required projects

In the period from 4 April 2017 to 30 May 2017, the transmission system operators carried out a non-binding capacity demand survey in accordance with the requirements of the CAM Network Code. It has to be noted that capacity demands are submitted to the Austrian TSOs throughout the year and subsequently included in the next NDP planning process. According to the CAM Network Code, the transmission system operators were not obliged to accept capacity requirements submitted later than on 30 May 2017. In the course of the survey, shippers were able to report capacity demands at the TSOs' cross-border interconnection points.

The MAM carried out a project data collection for the same period. During the project data collection phase, the transmission system operators in the neighbouring countries were given the opportunity to report their projects and the resulting capacity requirements to the Austrian transmission system operators.

The transmission system operators analysed the capacity demand submitted (by shippers and within the scope of project submission). Capacity requirements which could not be met by existing free capacities were communicated to the market area manager on 5 June 2017. Together with the transmission system operators, the market area manager aggregated the requirements submitted and prepared the capacity scenario for the 2017 CNDP. The capacity scenario is shown in Chart 2 below.

Chart 2: Capacity scenario



Source: AGGM, GCA, TAG; 2017

Capacity demand is divided into four categories:

- Capacity requirements arising from the non-binding capacity demand survey: These capacity requirements were submitted by the shippers and are marked in Chart 2 in yellow.
- Capacity requirements based on project data collection including PCIs. These capacity requirements are marked in Chart 2 in green.
- Capacity requirements which were submitted previously and are currently in the implementation phase. These capacity requirements are marked in Chart 2 in blue.
- Capacity demand included in the planning by the transmission system operators themselves or in order to meet requirements imposed by the authority. These capacity requirements are marked in Chart 2 in grey.

The capacity requirements submitted are described individually in chapters 5 and 6.

The capacity scenario was discussed and coordinated with E-Control Austria on 14 June 2017.

During the planning phase, the transmission system operators developed projects that are suitable to meet the demand included in the capacity scenario. An allocation of capacity demand to required projects is shown in Table 7 below.

Table 7: Projects required to meet the submitted capacity demands

Demand	Project-number	Projekct-sponsor	Projectname	Implementation time frame [years]	Planned completion [date]
Entry Überackern +250.000 Nm³/h					
	2015/02a	GCA	Entry Überackern	4,5	
	2016/02	TAG	AZ1 additional entry and connection with BOP13		Q3/2018
Entry / Exit Reinthal +750.000 Nm³/h					
	2015/01a	GCA	Bidirectional Austria Czech Interconnector	4,5	
	2016/05	TAG	TAG Baumgarten interconnection capacity (BACI)	4,5	
Entry Mosonmagyarovar +570.000 Nm³/h					
	2015/05	GCA	Entry Mosonmagyarovar	4,5	
	2016/04	TAG	TAG Baumgarten interconnection capacity (Mosonmagyaróvár)		Q4/2021
Entry Mosonmagyarovar +1.000.000 Nm³/h					
	2017/01	GCA	Entry Mosonmagyaróvár Plus	4,5	
	2017/01	TAG	TAG Baumgarten interconnection capacity (Mosonmagyaróvár) II	4,5	
Mehrbedarf Verteilergebiet +600.000 Nm³/h					
	2015/07b	GCA	Additional Demand in Distribution Area +		Q3 2018
	2016/02	TAG	AZ1 additional entry and connection with BOP13		Q3 2018
Exit Andorf +5.000 Nm³/h					
	2017/02	GCA	Penta West – Exit distribution area	1,5	
Entry Arnoldstein +1.000.000 Nm³/h					
	2016/01	TAG	TAG Reverse Flow Weitendorf/Eggendorf		Q4/2019
	2015/10	GCA	Entry Arnoldstein		Q3/2018
Entry Murfeld +620.000 Nm³/h / Exit Murfeld +391.620 Nm³/h					
	2015/08	GCA	Entry/Exit Murfeld	4,5	
	2016/01	TAG	TAG Reverse Flow Weitendorf/Eggendorf		Q4/2019
		TAG	look up Kapitel 6.5.2.		
Exit Baumgarten TAG +1.000.000 Nm³/h					
	2016/03	TAG	Reverse Flow Baumgarten MT Station (MS2)		Q4/2019

Source: GCA, TAG, AGGM; 2017

4.2 Alternative capacity supply

Pursuant to section 62 (6), the market area manager's responsibility involves ensuring coherency between the coordinated network development plan and the long-term planning of the distribution area manager.

The TSOs rightly included the capacity requirement of 250,000 Nm³/h at the Überackern entry point as freely allocable capacity and developed corresponding projects in order to meet the demand. The report on the market demand analysis with regard to the process — starting in 2017 — of creating new capacities between the Eastern market area (Austria) and NetConnect Germany (Germany) of 27 July 2017 indicated that GCA plans an auction in July 2018 to market those capacities.

The report suggests that the capacity required in Austria should be taken from the Haidach storage facility. Apparently, the goal of this capacity request involving the Haidach storage facility is to gain access to the Austrian VTP.

In case the auction to market the projected FZK capacity at the Überackern entry point is not successful and the demander of the capacity is not satisfied with interruptible capacity, an alternative form of capacity supply must be considered in order to meet the customer's need.

The infrastructure of the Austrian distribution area is designed in a way that enables a powerful connection to the Haidach storage facility only to be established by setting up a metering station.
A total capacity of 200,000 Nm³/h in the form of standard capacity is currently available. After implementation of various projects in the distribution area (see also 2017 Long-term Planning), the entire requested capacity will be available in the form of standard capacity by Q3/2018.

5 Network development plan of Gas Connect Austria

Austria plays a key role within the European natural gas grid. This is seen for example in the Baumgarten station, one of Europe's most important interconnection points for natural gas supplied by Russia, Norway and other countries. Europe's demand for gas, which has been rising for decades, Austria's central position at the heart of Europe and the highly advanced technology used in the Austrian gas grid are factors making this network one of the critical hubs within Europe's system for the supply of natural gas. The Austrian gas grid has been known for its reliability, quality awareness and customer orientation – features that are vital to successfully competing in the European market. What is more, a highly developed and reliable gas grid represents a major asset attracting businesses. Consistent expansion along with new projects are aimed at ensuring future attractiveness of the gas network as well as at preserving its status as a hub of activity and maintaining the its ability to optimally meet market needs.

The network development plan (NDP) of Gas Connect Austria GmbH (GCA) presents GCA's current planning activities based on demand and adjacent infrastructure projects submitted. GCA's NDP also describes the latest developments in capacity marketing and the current capacity marketing environment. On this basis, non-binding capacity demand and projects submitted at GCA interconnection points are described and the impact on GCA's transmission system is analysed.

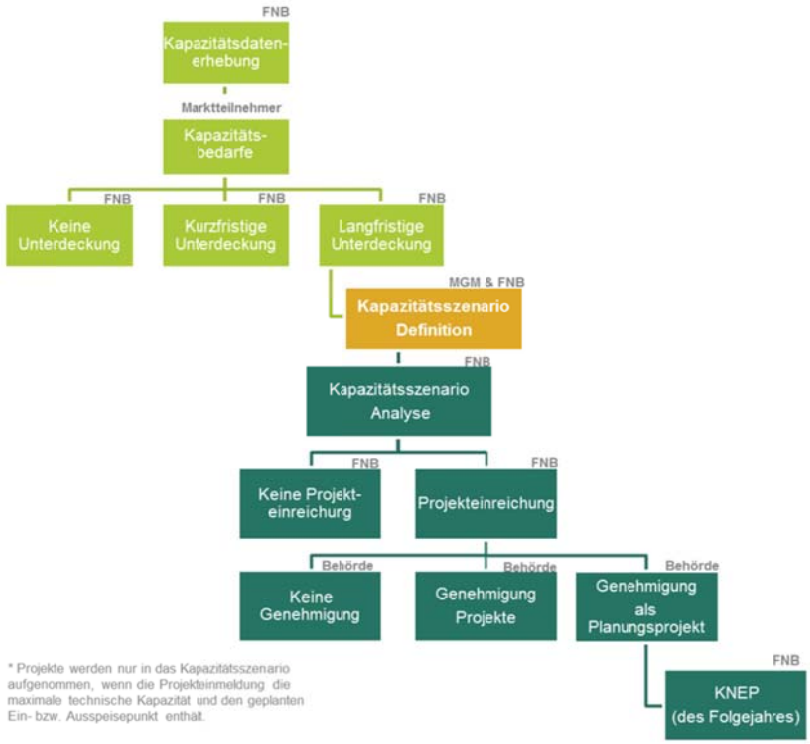
As GCA's NDP is an integral part of the Coordinated Network Development Plan, the measures planned were defined in consultation with the Austria transmission system operator (TSO) TAG GmbH and the adjacent TSOs. The cross-border aspect of network development planning is crucially important for GCA. Therefore, GCA also analyses planned developments at entry and exit points to and from neighbouring countries in terms of their direct effect on transport capacities within the Austrian market area.

As well as describing planning activities in the form of infrastructure projects, the NDP also outlines further steps for allocation of additional capacity and or capacity to be created. The NDP planning process as an integral component of the CNDP is shown in Chart 3.

While it is possible to report capacity needs all year round, only the needs submitted up to a specified reference date are to be included as the basis for the network development plan. The Network Code on Capacity Allocation Mechanisms (NC CAM) defines this reference date for 2017. The NDP is submitted and published once per year as part of the CNDP.

In addition to the projects presented in this NDP, GCA also provides a description of its replacement/optimisation/safety investments. Detailed technical parameters for these investments are submitted to the authority in a confidential attachment.

Chart 3: NDP planning process



Source: GCA; 2017

5.1 Focus on the customer

Building success through customer relationships. GCA's objective is to optimally meet customers' needs and constantly enhance service quality and customer satisfaction. The results of the most recent customer satisfaction survey confirm the superior quality of customer contact. This quality provides at the same time a basis for future developments. Customers awarded GCA the highest rating for overall satisfaction. A very high rating was also given for GCA's active key account management. This is associated with a special relationship with GCA that is especially valued by GCA's customers. The next customer satisfaction survey is scheduled for Q4/2017.

Numerous auctions. Since 1 April 2013, GCA has carried out 438,328[1] auctions on PRISMA. The number of auctions offered increased by 24,864 from the figure given in the 2016 NDP. Demand continues to be predominantly for short-term services. This trend is at the expense of long-term capacity bookings (services on an annual basis). Services on an hourly, daily, monthly or quarterly basis account for over 99% of hourly capacity sold. Up to 700 auctions on an hourly basis are offered every day. Daily capacity, with a booking frequency of approximately 55 minutes, continues to be the most frequently booked capacity product.

[1] As of 7 August 2017 end of the day.

Current booking behaviour does not indicate any congestion. We have learned from auctions of long-term capacity services that the opening bid mostly turns out to be the market clearing price; consequently, no congestion is derived from these auction results. More than 93%[2] of all auctions since the start of 2017 were successfully completed without an auction surcharge. It can therefore be concluded that the capacity offered is sufficient.

Maximising possibilities. GCA believes that one of a logistic services provider's chief tasks is to maximise customers' options – while, of course, fully complying with the applicable statutory framework. Customers should have the right to choose services in line with their reasonable expectations. Supporting grid expansion and security of supply, long-term services should be designed to be correspondingly attractive.

5.2 Milestones in 2017

Further increasing customer satisfaction at Gas Convention 2017. GCA extended an invitation to the 2017 Gas Convention on 30 March 2017 as a step to further enhance customer satisfaction. The event, which was held in Vienna for the third time, was the setting for stimulating discussions between GCA's customers and representatives on the topic of "Virtuality Goes Reality". The topics covered ranged from the "virtual" background processes (e.g. tariff methods) to the "real" world (e.g. the new Capacity Utilization® customer platform) and how these areas relate. The potential actions identified in the workshops have already or are currently being implemented (e.g. publication of a more easily read tariff sheet in EUR/MWh).

Capacity Utilization® – our new customer platform. GCA's customers recently were given access to a new and highly efficient capacity management system. Referred to under the name of Capacity Utilization (CU), it replaces the previous OCB system. CU provides customers with vast benefits.
Now they can

- easily complete the PRISMA registration process and view their current registration status
- speedily allocate capacities in a user-friendly interface,
- use CU as a fallback for PRISMA,
- and process capacity surrenders online.

Investments in supply – and in Austria. Ongoing investments in the transmission network help ensure the supply of gas to Austria and neighbouring countries. This ensures that operations can be maintained and reduces any risk of complete outage. The expansion measures undertaken in this connection additionally guarantee that potential capacity increases are achieved in future. Such investments strengthen Austria's attractiveness for businesses and create new jobs.

Maintenance to ensure sustainability. Extensive maintenance activities were planned again in 2017. At the beginning of each project, effort is made to identify alternatives able to be implemented during operations. This is done in particular to avoid or at least keep to a

[2] As of 6 August 2017 end of the day.

minimum long downtime periods. GCA consistently seeks to meet customers' transport preferences as closely as possible and to maximise capacity supply. The highest priority is consequently put on avoiding transport restrictions.
Any capacity restrictions that nonetheless arise are usually announced well enough in advance.

Security first. GCA has launched the Cerberus project to put in place an all-encompassing security management system. The corresponding measures relate to all procedures and actions taken by a company or organisation to protect against any possible attacks. The aim is to guarantee at all times ongoing operations and thus security of supply. IT security has also been enhanced. With a sharp in-crease in hacker attacks also seen in Austria in recent months, GCA has succeeded in warding off all such attempts up to now.

Bundling is the first priority – connection to RBP. GCA was previously connected only to the PRISMA platform. With the connection in 2017 to the Regional Booking Platform® (RBP), an auction platform for capacities, bundled allocations can now also be offered at the Mosonmagyaróvár entry point. To prepare for the move, an appropriate connection plan was developed by GCA in cooperation with Hungarian transmission system operator FGSZ LTD. and the two regulators E-Control Austria and Magyar Energetikai és Közműszabályozási Hivatal (MEKH). The first bundled capacity allocation could already be carried out on the date of the annual auctions on 6 March 2017.
As of 1 August 2017 it is possible to carry out via RBP each and every auction at the Mosonmagyaróvár entry point. This does away with the necessity, raised by two different platforms, of allocating unbundled capacities at an entry point in Austria. Article 19 of the CAM NC has thereby been successfully implemented. When switching platforms from PRISMA to RBP at the Mosonmagyaróvár entry point, the pioneering feat was to make the change during running operations.

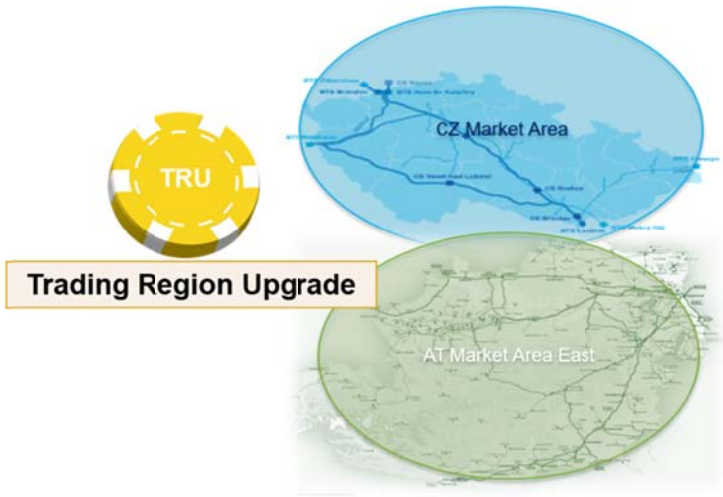
Consistently implementing regulatory requirements must obviously not result in sudden restriction of a transmission system operator's freedom to market capacities – especially when dependent on other operators or member countries. That is unfortunately exactly what happened to FGSZ during bundled allocation of the annual capacities:
On the business day prior to the annual auction, Hungarian regulatory authority MEKH prohibited FGSZ from offering annual capacities as of 1 October 2019. In response, FGSZ removed from the platform the annual shares beginning with October 2019. In view of the bundling obligation, GCA had no alternative but to acknowledge this deletion. Another consequence was that annual capacities could be offered in bundled allocations for only two consecutive years instead of 15. This makes little sense from an economic standpoint. Unfortunately, due to the short-term announcement of the auction stop, no timely alternative solutions could be identified either.

Market demand assessment reports. For the first time, the NC CAM provides for transmission system operators (TSOs) to publish reports analysing market demand between neighbouring market areas. These reports are also intended to include a forecast of the capacity projects resulting from the demand. GCA prepared a total of five such reports in consultation with neighbouring TSOs. The consultation process could be successfully completed despite the large number of neighbouring system operators, with the reports being published and submitted to ENTSOG on schedule.

5.3 TRU: an innovative marketing concept

Together with N4G, GCA has developed a concept for integrating the AT and CZ gas markets by offering additional connections (see Chart 4).

Chart 4: TRU



Source: GCA; 2017

An initiative referred to as Trading Region Upgrade (TRU) is intended to enable customers to transport gas volumes between the Eastern gas market area in Austria and the Czech gas market. Using existing infrastructure, parallel access is enabled to the two virtual trading points (VTPs), meaning that customers are guaranteed simultaneous access to the neighbouring VTP in addition to the respective national VTP. The resulting enhanced flexibility is intended to reinforce the Austrian gas market's role as a hub.

The option of dedicated withdrawal of gas from the Eastern market area in Austria while simultaneously injecting a corresponding volume in the Czech gas market simplifies gas transport, reduces transaction costs for system users and facilitates cross-border access to markets. This also represents an important step towards integrating the Austrian and Czech markets.

The TRU initiative was presented to market participants in a written consultation procedure in April 2016. Responses received show that there is interest in this service. A corresponding proposal by E-Control Austria to amend the Gas System Charges Ordinance (*GSNE-VO*) and set the fees for this service is currently under assessment. Based on current plans, marketing is planned to start in Q4 of 2017.

5.4 Black Sea corridor

Well developed and flexible gas infrastructure represents a specific contribution towards realising the objectives defined for European energy policy: market integration, security of supply, competition and sustainability. Such infrastructure stimulates market activity and enhances its liquidity.

Alongside existing routes, an important role is played here by new transport routes and sources of natural gas, which help to further diversify the supply of energy. As a result, special importance is placed on the Black Sea corridor. This focus is explicitly acknowledged in documents such as ENTSOG's Gas Regional Investment Plans (GRIPs). Whereas the infrastructure of other European countries is closely aligned with domestic consumption, the countries belonging to the Black Sea corridor play a major role in transit. Thus, utilising this infrastructure to transport new potential gas volumes could have a positive impact on security of supply in Europe.

Meanwhile, new gas routes also enhance the security of supply to the transit countries themselves, considering that from today's perspective countries such as Romania and Hungary would in some cases be hard hit by any disruptions in supply. This could result in irregular peak loads – and the infrastructure has to be able to manage such peak loads. As this is currently not the case everywhere, it is of major significance to develop the corridor. A further advantage here is that such development is subject to the European legal framework. This is expected to guarantee reliability and legal certainty in planning and implementation.

A central element of the European legal framework is the PCI process, with the objective of identifying projects of common interest for Europe. As represented by the ROHUAT/BRUA corridor project, the Black Sea region plays a key role in this process. The project comprises various sub-projects that have been designed as clusters to be implemented in several stages over time. As a result, it should become possible to assign additional capacities at the cross-border points in Bulgaria, Romania, Hungary and Austria, along a corridor operated bidirectionally.

As part of the ROHUAT/BRUA corridor project, GCA submitted the Mosonmagyaróvar project for inclusion in the 2016 European network development plan (TYNDP; see chapter 5.7.3 below), thereby fulfilling the first condition for inclusion in the next Union list of PCIs. The project is consequently part of the draft list confirmed on 13 July 2017 by the decision-making body of the NSI East Gas Priority Corridor (consisting of representatives of the Member States and the European Commission). The list is expected to be finalised in Q4/2017.

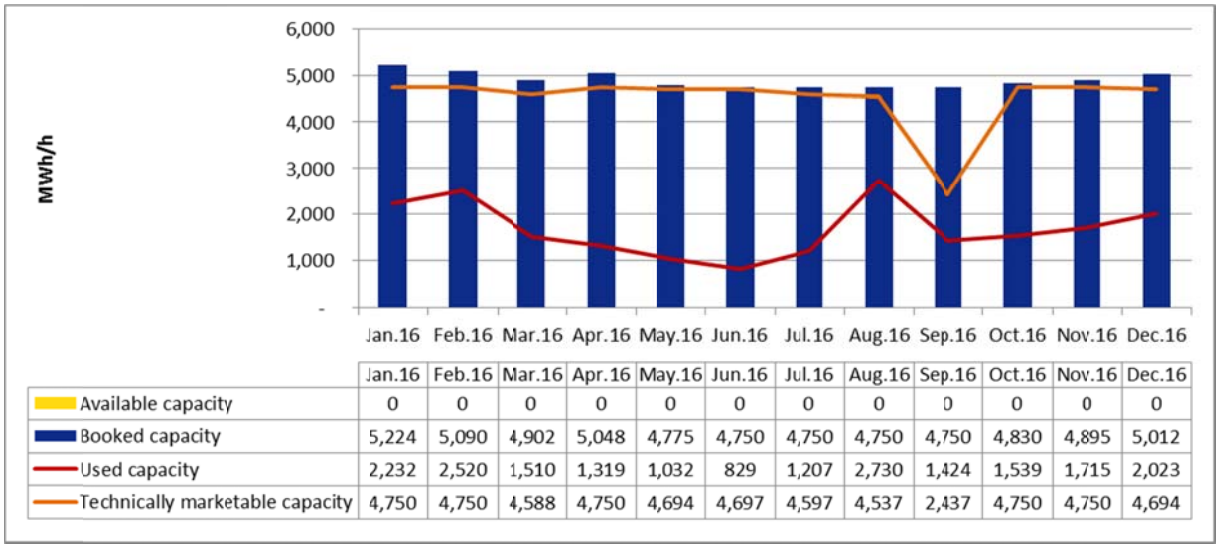
5.5 Capacity marketing – 2016 status report

Charts Chart 5-Chart 13show technically marketable capacity, available capacity, booked capacity and used capacity for each point and direction determined in accordance with the approved capacity calculation model[3] from 1 January 2016 to 31 December 2016.

Fluctuations in technically marketable capacity are attributable to maintenance work that restricts capacity. An updated maintenance plan is available on GCA's website at **LINK**. Short-term congestion management measures have released firm freely allocable capacities (FZK) as a result of the restriction on renomination. In some cases, this has resulted in booked capacity exceeding technically marketed capacity. The capacity used is the renominated capacity.

[3] Renominated capacity (UK, FZK, DZK)

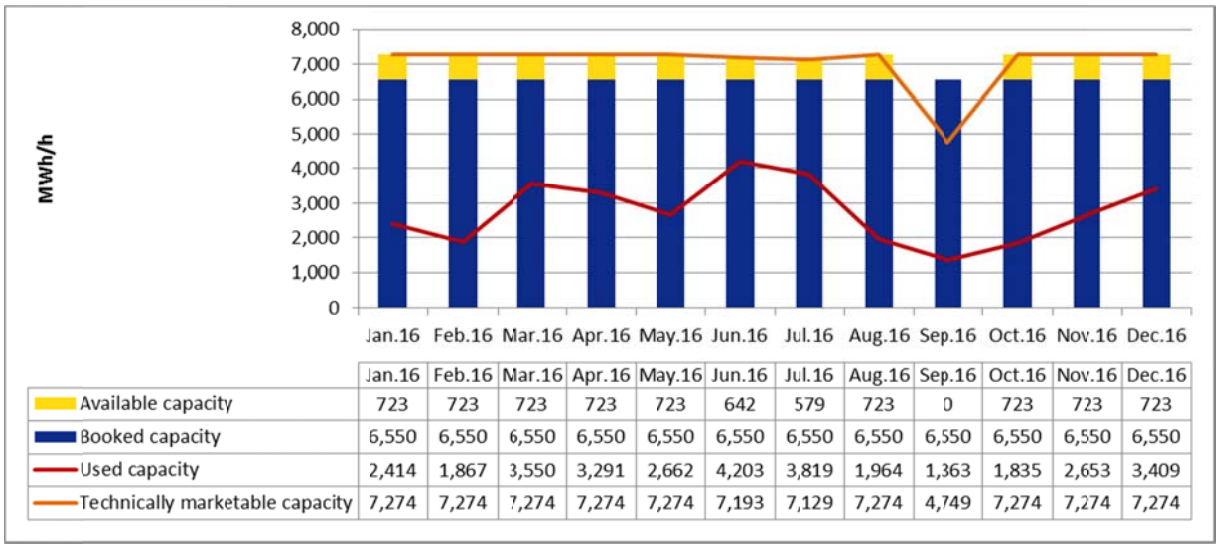
Chart 5: ÜBERACKERN ABG & SUDAL ENTRY POINT



	Jan.16	Feb.16	Mar.16	Apr.16	May.16	Jun.16	Jul.16	Aug.16	Sep.16	Oct.16	Nov.16	Dec.16
Available capacity	0	0	0	0	0	0	0	0	0	0	0	0
Booked capacity	5,224	5,090	4,902	5,048	4,775	4,750	4,750	4,750	4,750	4,830	4,895	5,012
Used capacity	2,232	2,520	1,510	1,319	1,032	829	1,207	2,730	1,424	1,539	1,715	2,023
Technically marketable capacity	4,750	4,750	4,588	4,750	4,694	4,697	4,597	4,537	2,437	4,750	4,750	4,694

Source: GCA; 2017

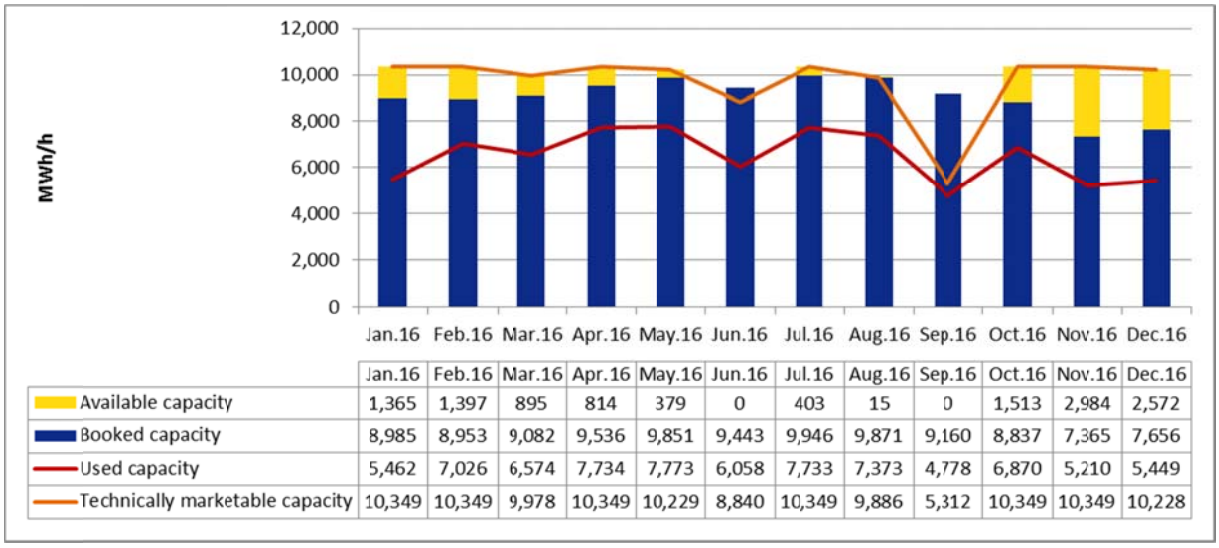
Chart 6: ÜBERACKERN ABG & SUDAL EXIT POINT



	Jan.16	Feb.16	Mar.16	Apr.16	May.16	Jun.16	Jul.16	Aug.16	Sep.16	Oct.16	Nov.16	Dec.16
Available capacity	723	723	723	723	723	642	579	723	0	723	723	723
Booked capacity	6,550	6,550	6,550	6,550	6,550	6,550	6,550	6,550	6,550	6,550	6,550	6,550
Used capacity	2,414	1,867	3,550	3,291	2,662	4,203	3,819	1,964	1,363	1,835	2,653	3,409
Technically marketable capacity	7,274	7,274	7,274	7,274	7,274	7,193	7,129	7,274	4,749	7,274	7,274	7,274

Source: GCA; 2017

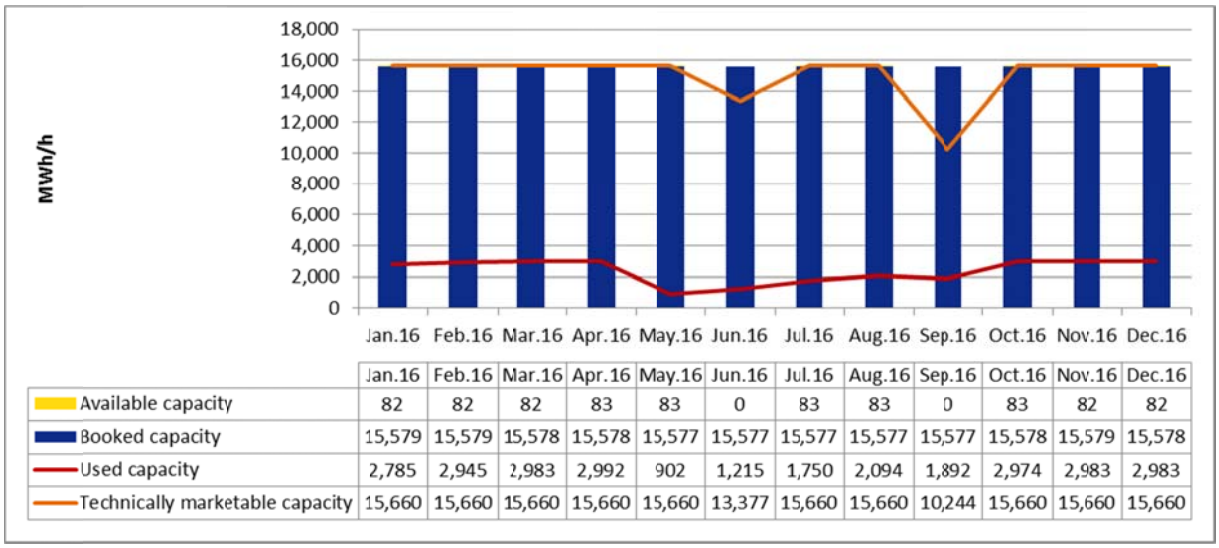
Chart 7: OBERKAPPEL ENTRY POINT



	Jan.16	Feb.16	Mar.16	Apr.16	May.16	Jun.16	Jul.16	Aug.16	Sep.16	Oct.16	Nov.16	Dec.16
Available capacity	1,365	1,397	895	814	379	0	403	15	0	1,513	2,984	2,572
Booked capacity	8,985	8,953	9,082	9,536	9,851	9,443	9,946	9,871	9,160	8,837	7,365	7,656
Used capacity	5,462	7,026	6,574	7,734	7,773	6,058	7,733	7,373	4,778	6,870	5,210	5,449
Technically marketable capacity	10,349	10,349	9,978	10,349	10,229	8,840	10,349	9,886	5,312	10,349	10,349	10,228

Source: GCA; 2017

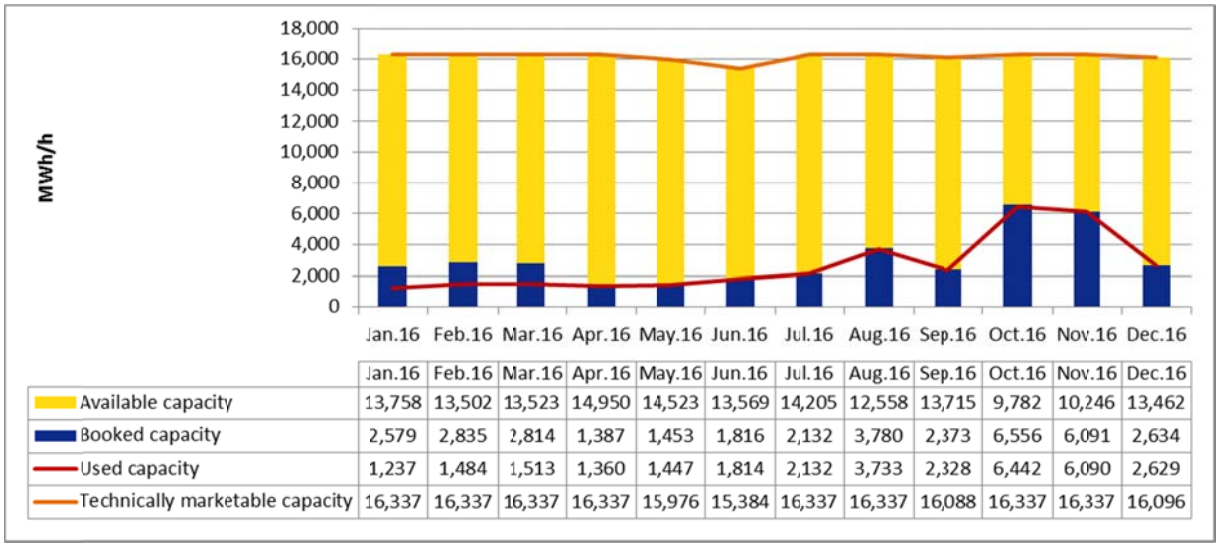
Chart 8: OBERKAPPEL EXIT POINT



	Jan.16	Feb.16	Mar.16	Apr.16	May.16	Jun.16	Jul.16	Aug.16	Sep.16	Oct.16	Nov.16	Dec.16
Available capacity	82	82	82	83	83	0	83	83	0	83	82	82
Booked capacity	15,579	15,579	15,578	15,578	15,577	15,577	15,577	15,577	15,577	15,578	15,579	15,578
Used capacity	2,785	2,945	2,983	2,992	902	1,215	1,750	2,094	1,892	2,974	2,983	2,983
Technically marketable capacity	15,660	15,660	15,660	15,660	15,660	13,377	15,660	15,660	10,244	15,660	15,660	15,660

Source: GCA; 2017

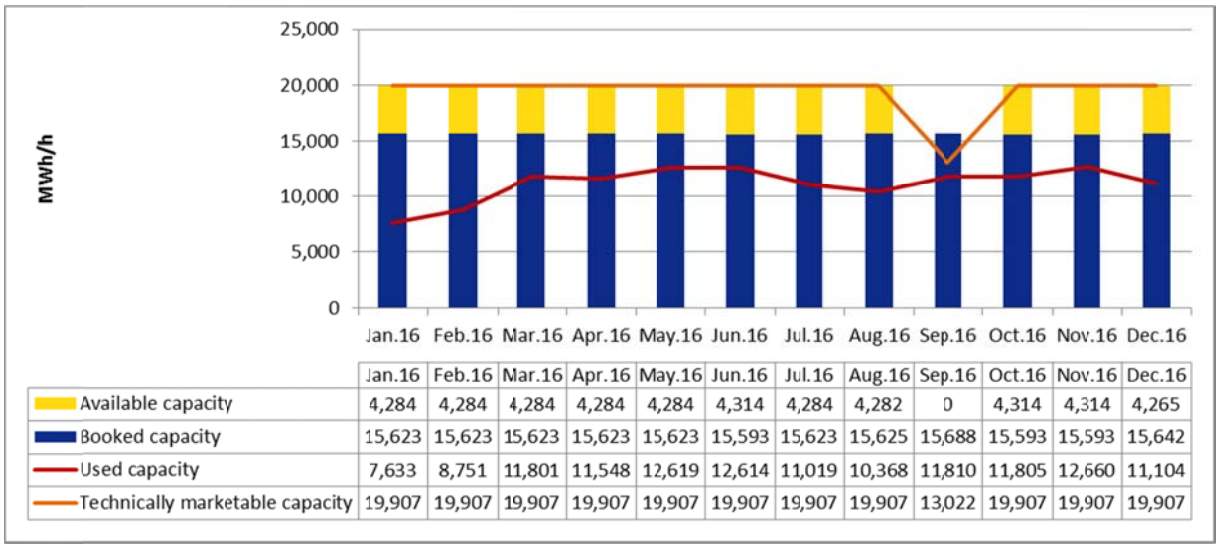
Chart 9: BAUMGARTEN GCA ENTRY POINT



	Jan.16	Feb.16	Mar.16	Apr.16	May.16	Jun.16	Jul.16	Aug.16	Sep.16	Oct.16	Nov.16	Dec.16
Available capacity	13,758	13,502	13,523	14,950	14,523	13,569	14,205	12,558	13,715	9,782	10,246	13,462
Booked capacity	2,579	2,835	2,814	1,387	1,453	1,816	2,132	3,780	2,373	6,556	6,091	2,634
Used capacity	1,237	1,484	1,513	1,360	1,447	1,814	2,132	3,733	2,328	6,442	6,090	2,629
Technically marketable capacity	16,337	16,337	16,337	16,337	15,976	15,384	16,337	16,337	16,088	16,337	16,337	16,096

Source: GCA; 2017

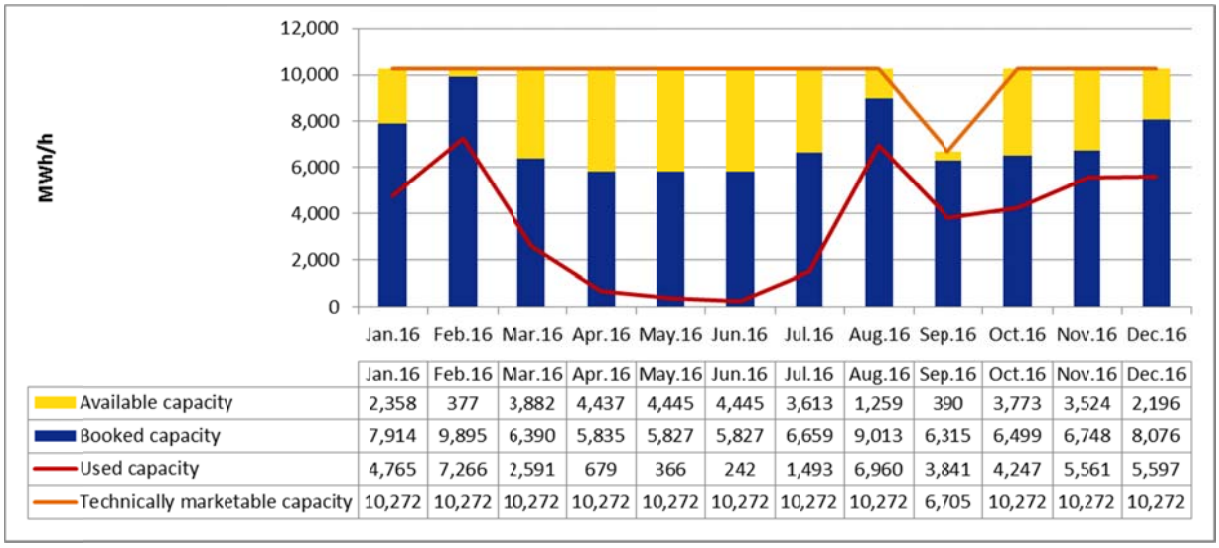
Chart 10: BAUMGARTEN WAG ENTRY POINT



	Jan.16	Feb.16	Mar.16	Apr.16	May.16	Jun.16	Jul.16	Aug.16	Sep.16	Oct.16	Nov.16	Dec.16
Available capacity	4,284	4,284	4,284	4,284	4,284	4,314	4,284	4,282	0	4,314	4,314	4,265
Booked capacity	15,623	15,623	15,623	15,623	15,623	15,593	15,623	15,625	15,688	15,593	15,593	15,642
Used capacity	7,633	8,751	11,801	11,548	12,619	12,614	11,019	10,368	11,810	11,805	12,660	11,104
Technically marketable capacity	19,907	19,907	19,907	19,907	19,907	19,907	19,907	19,907	13,022	19,907	19,907	19,907

Source: GCA; 2017

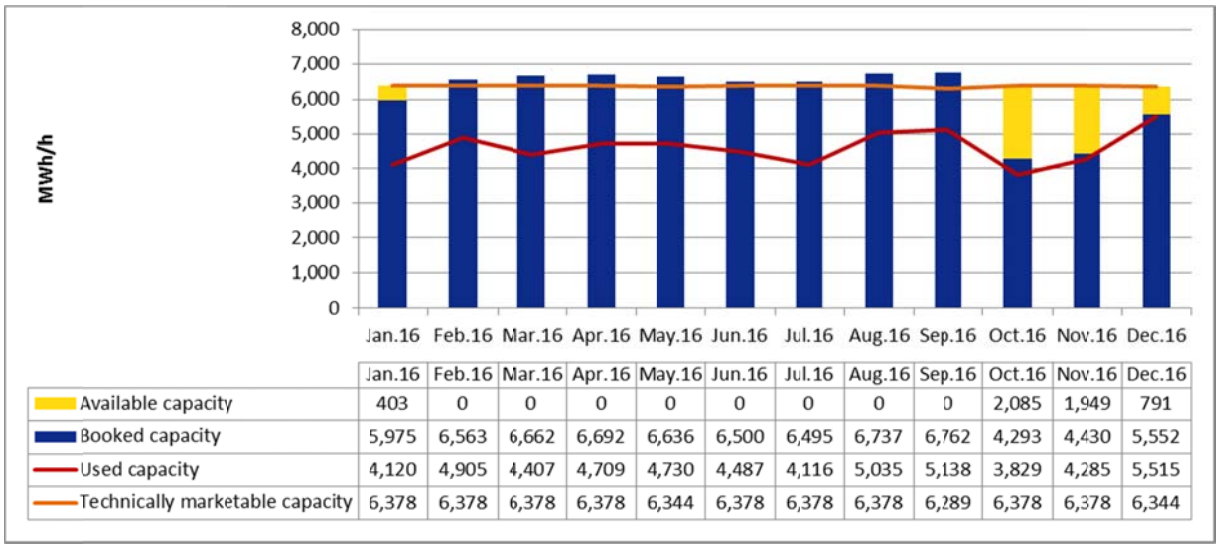
Chart 11: BAUMGARTEN WAG EXIT POINT



	Jan.16	Feb.16	Mar.16	Apr.16	May.16	Jun.16	Jul.16	Aug.16	Sep.16	Oct.16	Nov.16	Dec.16
Available capacity	2,358	377	3,882	4,437	4,445	4,445	3,613	1,259	390	3,773	3,524	2,196
Booked capacity	7,914	9,895	6,390	5,835	5,827	5,827	6,659	9,013	6,315	6,499	6,748	8,076
Used capacity	4,765	7,266	2,591	679	366	242	1,493	6,960	3,841	4,247	5,561	5,597
Technically marketable capacity	10,272	10,272	10,272	10,272	10,272	10,272	10,272	10,272	6,705	10,272	10,272	10,272

Source: GCA; 2017

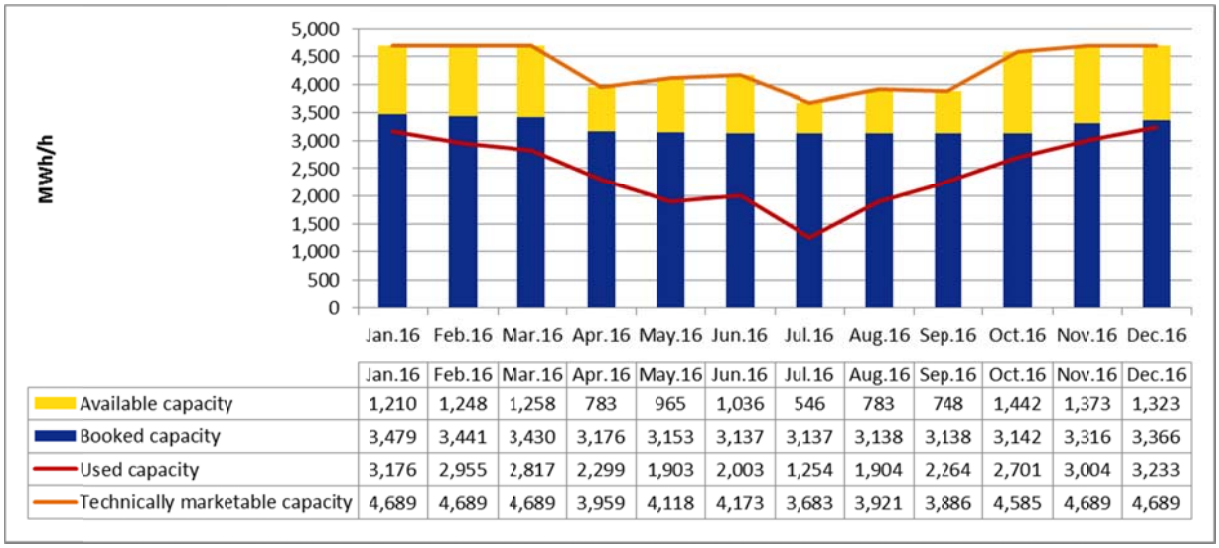
Chart 12: MOSONMAGYARÓVÁR EXIT POINT



	Jan.16	Feb.16	Mar.16	Apr.16	May.16	Jun.16	Jul.16	Aug.16	Sep.16	Oct.16	Nov.16	Dec.16
Available capacity	403	0	0	0	0	0	0	0	0	2,085	1,949	791
Booked capacity	5,975	6,563	6,662	6,692	6,636	6,500	6,495	6,737	6,762	4,293	4,430	5,552
Used capacity	4,120	4,905	4,407	4,709	4,730	4,487	4,116	5,035	5,138	3,829	4,285	5,515
Technically marketable capacity	6,378	6,378	6,378	6,378	6,344	6,378	6,378	6,378	6,289	6,378	6,378	6,344

Source: GCA; 2017

Chart 13: MURFELD EXIT POINT



	Jan.16	Feb.16	Mar.16	Apr.16	May.16	Jun.16	Jul.16	Aug.16	Sep.16	Oct.16	Nov.16	Dec.16
Available capacity	1,210	1,248	1,258	783	965	1,036	546	783	748	1,442	1,373	1,323
Booked capacity	3,479	3,441	3,430	3,176	3,153	3,137	3,137	3,138	3,138	3,142	3,316	3,366
Used capacity	3,176	2,955	2,817	2,299	1,903	2,003	1,254	1,904	2,264	2,701	3,004	3,233
Technically marketable capacity	4,689	4,689	4,689	3,959	4,118	4,173	3,683	3,921	3,886	4,585	4,689	4,689

Source: GCA; 2017

5.6 Demand as the basis for the plan

The objective of GCA's network development plan is to align available capacities at the entry and exit points as closely as possible with the future requirements of system users. GCA and TAG have agreed to allow for reporting of demand and neighbouring projects year-round. This is expected to make the process of submitting additional demand even more transparent. A certain reference date is defined each year and the reports received by that date will be included in the current network development plan. Project information and additional demand submitted to GCA after 1 June 2017 will automatically be included in next year's NDP.

In a PRISMA newsletter of 6 April 2017, GCA announced 1 June 2017 as the reference date for inclusion of additional demand. This timetable complies with the NC CAM and is uniformly defined for the European Union as a whole. GCA also contacted adjacent transmission system operators to ask them to provide information on projects adjacent to GCA's entry and exit points by the same date. This was done to ensure that any corresponding projects in the Austrian market area are developed by GCA and TAG GmbH jointly and so ensure cross-border planning at national level too. GCA has provided forms on its website as an aid to submitting additional demand. There are no formal requirements for submission.

At the existing exit points to the domestic system, no restrictions are currently identifiable for the planning period 2018-2027. The development of demand in the distribution area is carefully monitored in order to be able to proactively plan potentially necessary measures. The distribution area submitted additional demand for the Schärding region during the planning period in question.

In addition, one project was developed and approved in the 2016-2025 NDP on the basis of additional and demand from the distribution area. Further information on the status of the GCA 2015/07b project is contained in chapter 7.

The demand and projects at the entry and exit points shown in Table 8were submitted to GCA by the reference date of 1 June 2017.

Table 8: Incremental capacities (FZK) arising from non-binding demand submitted

		Capacities MWh/h															
	GCA points	2018	2019	2020	2012	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Projects
Entry points	Überackern SUDAL	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	GCA 2015/02a
	Mosonmagyarovar	4.737	4.737	4.737	4.737	4.737	4.737	4.737	4.737	4.737	4.737	4.737	4.737	4.737	4.737	4.737	GCA 2017/01
	Reintal	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	GCA 2015/01a
Exit points	Distribution area	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	
	Reintal	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	GCA 2015/01a

Source: GCA; 2017

Apart from the demand reported by the distribution area, the non-binding demand submitted was for bundled capacities.

From the demand information submitted by 1 June 2017, it appears that future demand can largely be met by existing capacities. The additional demand for 4,737 MWh/h reported for the Mosonmagyaróvár entry point (on the border with Hungary) will be re-planned and combined with capacities planned earlier.

5.7 From demand to planning

The non-binding demand submitted for GCA's entry and exit points is presented and analysed for the 2017–2026 planning period.

GCA has analysed the projected non-binding demand and adjacent projects which cannot be covered by existing capacities in GCA's systems in terms of the measures necessary. The non-binding demand and additional capacities submitted are shown as FZK capacities. FZK transport services offer connectivity to the VTP on a firm basis and thus represent the best quality available in the Austrian market area.

The individual projects were developed in close cooperation with the Austrian TSO TAG and the relevant adjacent TSOs. The following chapters describe the individual projects, analyse possibilities for integration into the European plan, present marketing concepts and describe national and international coordination activities as regards project planning. A summary of the projects, including technical measures, is contained in chapter 7.

The confidential attachment to the NDP contains a detailed analysis of all projects described in chapter 7, including the required technical measures, expenses incurred and economic viability. The attachment will be submitted to the authorities along with the final CNDP.

5.7.1 Additional demand in the distribution area [GCA2015/07b]

The GCA 2015/07b: Additional Demand in Distribution Area + project is currently being implemented. It was approved in the official decision approving the 2015 CNDP (V KNEP G 01/15) on 27 October 2015.

The project was occasioned by the DAM report to TSO GCA, as part of the 2016–2025 NDP, citing 600,000 Nm³/h of additional capacity needs. On completion of the project, a total of 960,000 Nm³/h from the distribution area will be made available to the transmission system as freely allocable capacities at the virtual entry point. The capacity scenario for the 2017–2026 NDP, in relation among other things to the Arnoldstein entry point, and the attendant project planning and coordination work at TSO level required the completion date to be changed to Q3/2018. This ought to ensure cost-effective implementation of the projects described in the 2017 NDP.

The project GCA 2017/02 Penta West - Exit distribution area was planned on the basis of capacities to supply the Schärding area, which were orderd for the first time by the distribution area manager this year. The aim of the project is to provide technical capacity along the Pent West at the station Andorf for an exit into the distribution area. An additional exit capacity of 5,000 Nm³/h in FZK quality from the virtual trading point to the distribution area is created with the project. The realisation period is indicated by about one and a half years. The implementation depends on the concretization of the requirement by the distribution area manager, therefore, the project will be submitted in the network development plan as an planning project.

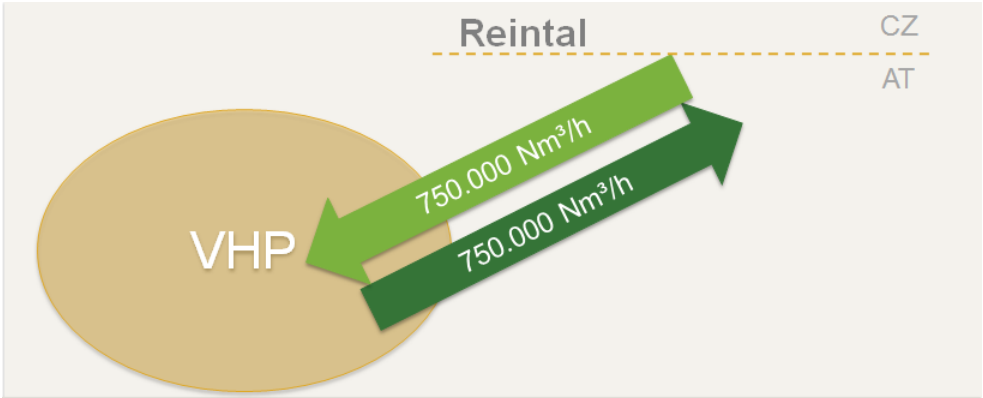
5.7.2 Bidirectional Austrian Czech Interconnector [GCA2015/01a]

The project aim is to interconnect the Austrian and Czech markets and to create for the first time technical bidirectional capacities on a freely allocable basis at a new Reintal entry and exit point. Integrating the two markets improves their liquidity and gives rise to new options for market participants and investors, including simplified access to the VTP in the other market. Strengthened competition is also expected to have positive impact for consumers. Market integration between the two countries is an important step towards setting up a north-south corridor in Europe, while also enhancing security of supply in Austria, the Czech Republic and throughout the CEE region.

Basis: project submission by N4G. N4G submitted the Czech part of project Bidirectional Austria Czech Interconnector (BACI) for inclusion in GCA's NDP during GCA's project data collection phase. This project submission specifies new bidirectional capacity of at least 8,393 MWh/h or 750,000 Nm³/h (0°C). This figure is exactly the capacity assumed for the BACI project in the Austrian market area. The submitted capacity reflects the parameters of the BACI TRAN-N-021 and TRA-N-133 PCI projects.

Additional capacities at the new Reintal point. The flow diagram in Chart 14shows the capacity situation at the new planned entry and exit point at Reintal, taking into account the capacity demand of 200 MWh/h or 17,873 Nm³/h (0 °C) submitted in 2017.

Chart 14: GCA 2015/01a



		Punkt	Neue technisch vermarktbare Kapazität	Qualität
Nm³/h	*FZK Kapazität zum VHP*	Reintal Entry	+750.000 Nm³/h	FZK
Nm³/h	*FZK Kapazität vom VHP*	Reintal Exit	+750.000 Nm³/h	FZK

Source: GCA; 2017

During the conception of the project the demand for an exit point to the distribution system was additionally analysed in collaboration with the Distribution Area Manager. The planned pipeline route crosses the route of the pipeline “Ebene 2 Ladendorf – Hohenau” at kilometer 37. The pipeline Ladendorf – Hohenau is operated with 12 bar(g). Therefore, a transportation via Ladendorf towards Laa is not possible due to pressure conditions. Additionally, the injection in this pipeline could only serve local demand, which is low. A crosslink further north from Reintal to Laa would require a pipeline with a length of approximately 35 km. Therefore, a simple

redundant withdrawal for Laa from BACI is not possible. Currently, there is no demand by the distribution system for an exit point to the distribution system along the planned BACI pipeline route.

Approved in the 2016-2025 NDP. Project GCA 2015/01a was previously approved as a planning project in the 2016–2025 CNDP. The measures for creation of the additional capacity offering on a freely allocable basis as per the project described were analysed over the 2018–2027 planning period and up-dated in GCA 2015/01a project data sheet (see chapter 7). The project is directly linked to the project TAG 2016/04.

Capacity allocation in cooperation with NG4.
The capacities would be marketed at the cross-border point at Reintal on the Austrian-Czech border, with the corresponding entry and exit capacities being offered at this new border point. This will provide a major boost towards integrating the Austrian and Czech markets.

An alternative to market integration is TRU, an innovative marketing concept providing the option of booking entry capacities at currently established and/or new planned border points in both countries (see chapter 5.3TRU: an innovative marketing concept).

Included in European plan. The BACI project is pursued by GCA and the Czech TSO NET4GAS, s.r.o. In 2014 feasibility studies for the project BACI were completed on Austrian and on Czech side. The feasibility studies were granted financial aid from the TEN-E programme. Additionally, the BACI project with the technical parameters as described in Annex 1 was included as "project of common interest" (PCI) number 6.4 in the Regulation (EU) No. 1391/2013. The funding agreement for partial funding from the EU CEF programme was signed in April 2015. In 2015, preparatory work for an application for investment was completed on time by project sponsors GCA and N4G.

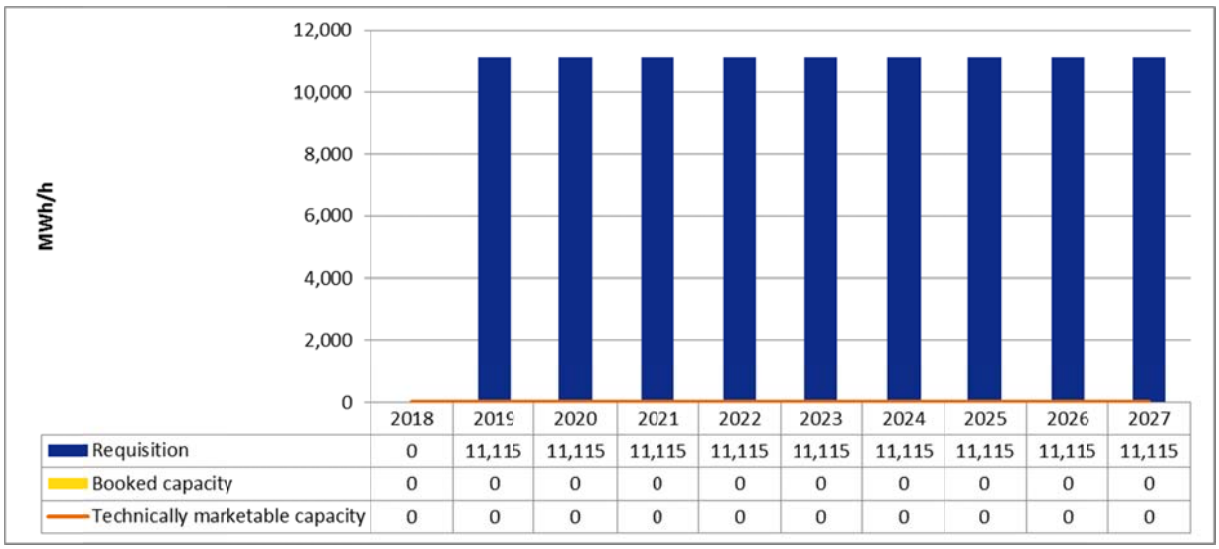
Within the scope of project data collection, GCA finally submitted for inclusion in the ENTSOG TYNDP 2017 those projects which were previously approved as projects in a 2016-2025 NDP, projects in respect of which an application for recognition of costs had already been submitted to the authority, or projects which currently have PCI status. Consequently, as a project with PCI status, BACI was additionally submitted and subsequently included in the European network development plan (TYNDP) 2017. In doing so, an important prerequisite was met for inclusion in the next Union list of PCIs. Finally, in early 2017, the project was officially submitted with a view to preparation of the third PCI list.
The BACI project is correspondingly part of the current draft list confirmed on 13 July 2017 by the decision-making body (consisting of representatives of Member State governments and the European Commission).

5.7.3 Entry Mosonmagyaróvár [GCA2015/05] & [GCA2017/01]

Basis: non-binding demand. Non-binding additional demand for the Mosonmagyaróvár entry point was submitted for inclusion in GCA's NDP. Non-binding demand for 4,737 MWh/h or 423,325 Nm³/h (0°C) at the Mosonmagyaróvár entry point was submitted by the reference date of 1 June 2017. Additional capacities are planned based on non-binding demand of 6,378 MWh/h or 570,000 Nm³/h (0 °C) submitted as part of the open season procedure (ROHUAT or Black Sea corridor). The additional demand at the Mosonmagyaróvár entry point was submitted as bundled capacity, as was the demand in the open season procedure. Chart 15 shows the

relationship between booked capacity, technical capacity and aggregate capacity demand at the Mosonmagyaróvár entry point. There is currently no applicable technical capacity at the Mosonmagyaróvár entry point, and as a result transports are currently performed only on an interruptible virtual basis.

Chart 15: Non-binding demand at the Mosonmagyaróvár entry point (in MWh/h)

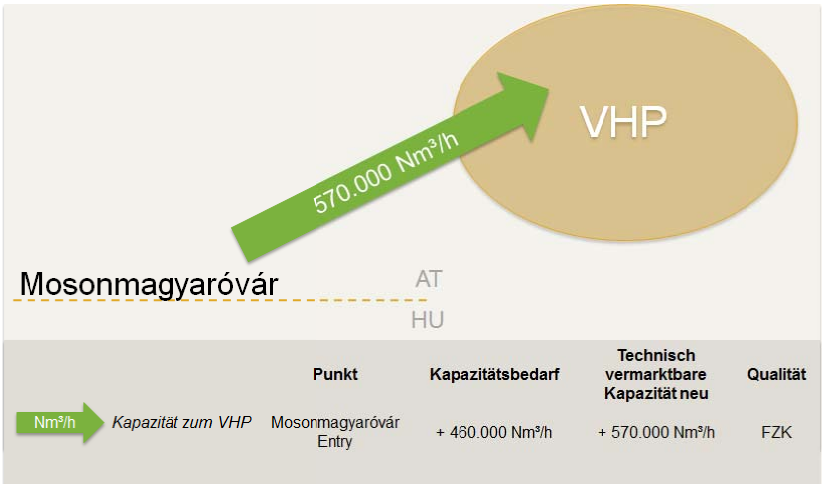


	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Requisition	0	11,115	11,115	11,115	11,115	11,115	11,115	11,115	11,115	11,115
Booked capacity	0	0	0	0	0	0	0	0	0	0
Technically marketable capacity	0	0	0	0	0	0	0	0	0	0

Source: GCA; 2017

Additional capacity at the Mosonmagyaróvár entry point. The flow diagrams in chartsChart 16 and Chart 17 illustrate the capacity situation at the potential Mosonmagyaróvár physical entry point. The volumes indicated are based on the GCA 2015/05 project, with 6,378 MWh/h or 570,000 Nm³/h (0 °C) in additional capacities, and the additional need for 4,737 MWh/h or 423,325 Nm³/h (0 °C) submitted in 2017.

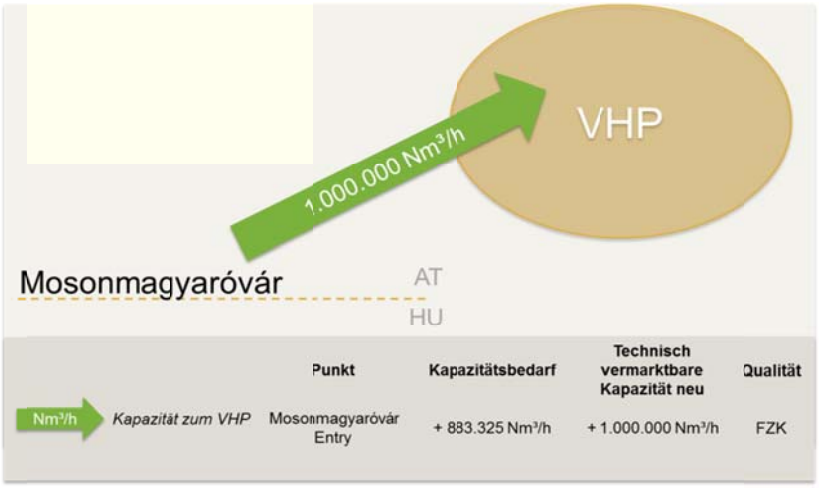
Chart 16: GCA 2015/05



		Punkt	Kapazitätsbedarf	Technisch vermarktbare Kapazität neu	Qualität
Nm³/h	*Kapazität zum VHP*	Mosonmagyaróvár Entry	+ 480.000 Nm³/h	+ 570.000 Nm³/h	FZK

Source: GCA; 2017

Chart 17: GCA 2017/01



		Punkt	Kapazitätsbedarf	Technisch vermarktbare Kapazität neu	Qualität
Nm³/h	*Kapazität zum VHP*	Mosonmagyaróvár Entry	+ 883.325 Nm³/h	+ 1.000.000 Nm³/h	FZK

Source: GCA; 2017

Coordination with adjacent TSOs. Regarding demand at the Mosonmagyaróvár entry point, GCA is in constant consultation with the TSOs FGSZ and Transgaz and the affected authorities, to analyse the time frame for implementation and capacity allocation for the projects. GCA and FGSZ exchanged information regarding demand submitted for the Mosonmagyaróvár point. The same non-binding capacity demand over the same time frame was also submitted on the Hungarian side. Between 03 February 2016 and 22 February 2016, a market survey was carried out to gather information on preferences for various capacity allocation methods during a binding open season.

Previously approved in the 2016-2025 NDP. Project GCA 2015/05 was previously approved as a project in the 2016-2025 CNDP. The measures for creation of the additional capacity offering on a freely allocable basis as per the project described were analysed over the 2018–2027 planning period and updated in the GCA2015/05 project data sheet (see chapter 7).

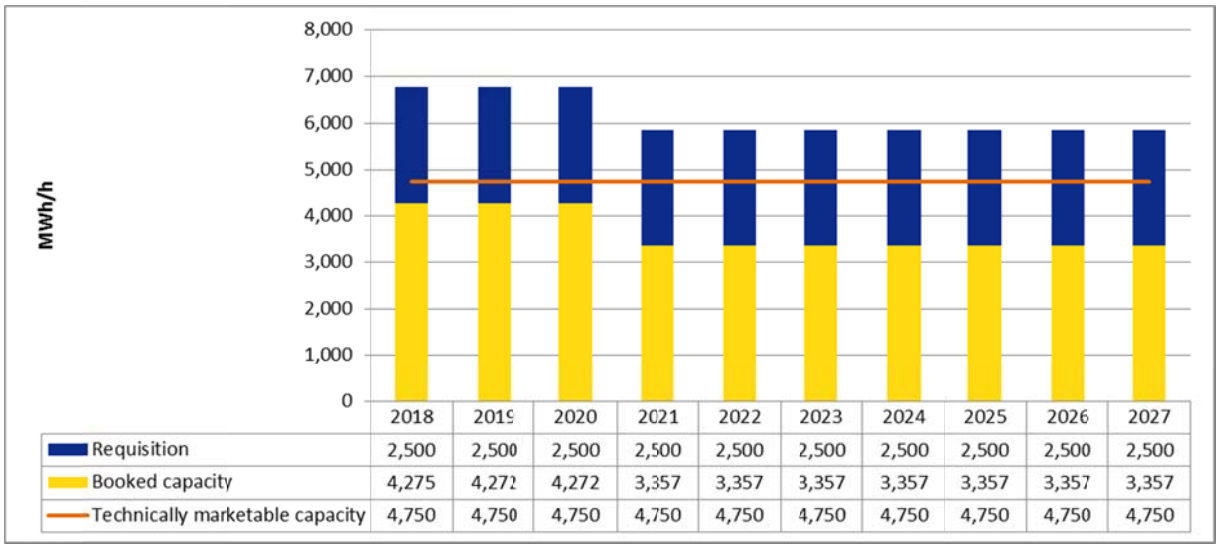
Concepts for capacity allocation. The capacity allocation plan for project GCA2015/05 in combination with GCA 2015/05 has not yet been finalised. In collaboration with FGSZ and Transgaz, a binding open season procedure was being developed. However, it was suspended unilaterally by FGSZ by letter of 18 July 2017.

Included in European plan. By 8 May 2016, GCA submitted for inclusion in the ENTSOG TYNDP 2017 projects which were previously approved as projects in a 2016-2025 NDP, projects in respect of which an application for recognition of costs had already been submitted to the authority, or projects which currently have PCI status. The project is included in the second Union list of projects of common interest. GCA therefore submitted the project for inclusion in the European network development plan (TYNDP) 2016 and fulfilled the first condition for inclusion in the next Union list of PCIs. The project is correspondingly part of the current draft list confirmed on 13 July 2017 by the decision-making body (consisting of representatives of Member State governments and the European Commission).
The list is expected to be adopted in Q4/2017.

5.7.4 Entry Überackern [GCA 2015/02a]

Basis: non-binding demand. Non-binding additional demand for the Überackern SUDAL entry point was submitted for inclusion in GCA's NDP. Non-binding demand for a maximum of 2,500 MWh/h or 223,414 Nm³/h (0°C) at the Überackern SUDAL entry point was submitted by the reference date of 1 June 2017. The additional capacity demand at the Überackern SUDAL entry point was submitted as bundled capacity. Chart 18shows the relationship between booked capacity, technical capacity and the aggregate capacity demand at the Überackern SUDAL entry point. At the Überackern entry point, the available technical capacity is limited and amounts to 4,750 MWh/h or 424,500 Nm³/h (0°C). In the long run, the additional demand for entry capacities cannot be met by the capacities available. As part of competitive marketing, it also planned to provide capacities at the Oberkappel entry point.

Chart 18: Non-binding demand at the Überackern entry point (in MWh/h)



	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Requisition	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Booked capacity	4,275	4,272	4,272	3,357	3,357	3,357	3,357	3,357	3,357	3,357
Technically marketable capacity	4,750	4,750	4,750	4,750	4,750	4,750	4,750	4,750	4,750	4,750

Source: GCA; 2017

Chart 19: GCA 2015/02a

		Punkt	Kapazitätsbedarf	Kapazität neu	Qualität
Nm³/h	*Kapazität zum VHP*	Überackern SUDAL Entry	+ 223.414 Nm³/h	+ 250.000 Nm³/h	FZK
Nm³/h	*Kapazität zum VHP*	Oberkappel	-	+ 250.000 Nm³/h	FZK

Source: GCA; 2017

Coordination with adjacent TSOs. In view of the competitive situation, GCA informed the German transmission system operators bayernets, OGE and GRTgaz of the demand submitted and the resulting project on the Austrian side. Demand was coordinated as part of preparing the market demand assessment report based on the NC CAM. According to the TSOs mentioned above, the German Gas NDP does not currently contain any corresponding projects.

As a further coordination measure, a project-specific variant for the cost-optimized use of existing infrastructure is currently being discussed. From bayernets, a pressure support was proposed, which is currently being subjected to a detailed analysis with regard to the economic and technical parameters.

Previously approved in the 2017-2026 NDP. Project GCA 2015/02a was previously approved as a project in the 2017-2026 CNDP. The measures for creation of the additional capacity offering on a freely allocable basis as per the project described were analysed over the 2018–2027 planning period and updated in the GCA2015/02a project data sheet (see chapter 7).

Concepts for capacity allocation. The capacity allocation plan for this project has not yet been finalised. To permit bundled allocation of the additional capacities created with due regard for competition at the Überackern SUDAL, Überackern ABG and Oberkappel points and using current technical capabilities, approval for the bundling of additional capacity and existing capacity on the German side is required. No such approval was given by the German regulatory authority at the 2017 annual auction. Our counterparts in Germany did not, therefore, see themselves in a position to allocate bundled capacities. In the 2018 annual auction, GCA plans capacity allocation in line with currently valid regulatory specifications and will consult accordingly with the TSOs in Germany and the regulatory authorities involved.

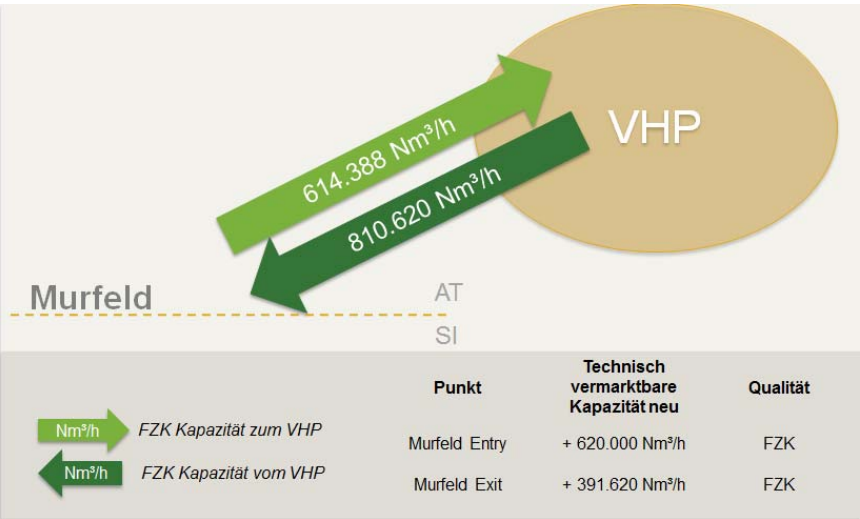
Integration into European plan: The project is not part of European planning.

5.7.5 Entry/Exit Murfeld [GCA2015/08]

Based on the PCI. Slovenian TSO Plinovodi submitted the projects "Upgrade of Murfeld-Czersak inter-connection", "Upgrade of Rogatec interconnection" and "CS Kidricevo" for inclusion in GCA's NDP during GCA's data collection phase. This project submission specifies new and/or additional technical bidirectional capacities of 6,875 MWh/h or 614, 388 Nm³/h (0°C) at the Murfeld entry point and 4,393 MWh/h or 391,620 Nm³/h (0°C) at the Murfeld exit point. This figure is exactly the capacity assumed for the “Entry/Exit Murfeld” project in the Austrian market area.

Additional capacity at the Murfeld entry/exit point. The flow diagram in Chart 20 illustrates the new capacities at the Murfeld entry and exit point. At this time, available technical capacity at the Murfeld exit point is limited and amounts to 4,688 MWh/h or 419,000 Nm³/h (0°C). There is currently no applicable technical capacity at the entry point, and as a result transports are performed only on an interruptible virtual basis.

Chart 20: GCA2015/08



Source: GCA; 2017

Coordination with adjacent TSOs. Since the projects were first submitted for the 2016–2025 NDP by Slovenian TSO Plinovodi, GCA and Plinovodi have been in ongoing consultation and implementing all projects along the corridor extending to the LNG terminal in Croatia.

Previously approved in the 2016-2025 NDP. Project GCA 2015/08 was previously approved as a project in the 2016-2025 CNDP. This project was put on hold in the last year's KNEP 2016 and has been replaced by an extended project with TAG GmbH (GCA 2016/03). Due to a different implementation timeline the original projects (GCA 2015/08 & GCA 2015/10) are again relevant for the planning from 2017 onwards. The measures for creation of the additional capacity offering on a freely allocable basis as per the project described were analysed over the 2018–2027 planning period and updated in the GCA2015/08 project data sheet (see chapter 7).

Concepts for capacity allocation. The additional capacities to be provided were first offered in the 2017 annual auction. The outcome of the market test was negative due to negligible demand. One possible explanation is the general postponement of the schedule for the LNG terminal in Croatia. A further market test planned in consultation with TSO Plinovodi is expected to better clarify the situation.

Included in European plan. By 8 May 2016, GCA submitted for inclusion in the ENTSOG TYNDP 2017 projects which were previously approved as projects in a 2016-2025 NDP, projects in respect of which an application for recognition of costs had already been submitted to the authority, or projects which currently have PCI status. The project is currently included in the second Union list of projects of common interest. GCA therefore submitted the project for inclusion in the European network development plan (TYNDP) 2016 during the project data collection phase and thus fulfilled the first condition for inclusion in the next Union list of PCIs. The Murfeld project is correspondingly part of the current draft PCI list confirmed on 13 July 2017 by the decision-making body (consisting of representatives of Member State governments and the European Commission).
The list is expected to be adopted in Q4/2017.

5.7.6 Entry Arnoldstein [GCA2015/10]

Basis: cooperation. To create the maximum freely allocable capacities at the Arnoldstein entry point, a corresponding project to strengthen GCA's systems was developed in cooperation with TAG GmbH. The GCA Project 2015/10 encompasses only technical measures that are required to transport FZK capacities of 11,190 MWh/h or 1,000,000 Nm³/h (0°C) agreed with TAG GmbH to the VTP and to allow capacities to be diverted into downstream systems.

Coordination between the TSOs. There was coordination at operational level during project planning to enable project parameters to be aligned and coordinated planning to be ensured. Project coordination is ongoing and the project is being implemented.

Previously approved in the 2016-2025 NDP. Project GCA 2015/08 was previously approved subject to conditions in the 2016-2025 CNDP. The measures for creation of the additional capacity offering on a freely allocable basis as per the project described were analysed over the 2018–2027 planning period and updated in the GCA2015/10 project data sheet (see chapter 7). The project is directly linked to the project TAG 2015/02.

6 Network development plan of Trans Austria Gasleitung GmbH

The transmission system of Trans Austria Gasleitung GmbH ("TAG GmbH") contributes significantly to the safe and secure, environmentally friendly and cost-effective supply of energy to both the Austrian and European gas markets.

TAG GmbH considers that it has a responsibility to adapt its system to suit continuously changing circumstances, develop corresponding infrastructure projects, promote market integration, and in this way open up new possibilities for its customers and ensure a high level of security of supply. In accordance with Regulation (EU) 715/2009 and Regulation (EU) 459/2017, the latter of which entered into force on 6 April 2017, TAG GmbH maintains constant contact with the operators of adjacent transmission systems and the various other stakeholders in the gas market with the aim of advancing network integration yet further.

The objective of this Network Development Plan is to give an overview of the progress achieved in pending projects and to present potential new projects and replacement investments submitted for approval.

6.1 Ongoing development of marketing concepts and customer relationships

Innovative marketing concepts

With the objective of further implementation of the Network Code on Capacity Allocation Mechanisms in Gas Transmission Systems[4] (CAM Network Code), TAG GmbH, as a share-holder in the PRISMA platform, is actively working on advancement of both the primary capacity platform and the secondary-market platform for capacity booking on PRISMA. In particular, TAG GmbH, together with other transmission system operators, is working to implement the new procedure for incremental capacity laid down in the CAM Network Code.

All capacities offered by TAG GmbH at the relevant Baumgarten and Arnoldstein entry points (reverse flow) and at the Baumgarten and Arnoldstein exit points are auctioned off on the PRISMA platform, with TAG GmbH aiming to offer capacities in the best possible quality and in bundled form.

Pursuant to item 2.2.4 of the congestion management procedures published in the Official Journal of the European Union on 28 August 2012, TAG GmbH also offers TAG system users the option to return bindingly booked, guaranteed capacities which were contracted by the system user at an entry or exit point, except for capacity products with a term of one day or less. TAG GmbH offers these surrendered capacities, as well as capacities arising from application of the short-term day-ahead UIOLI ("use it or lose it") rules, alongside TAG capacities in the corresponding auctions.

Since October 2015, TAG GmbH has also offered customers maximum scope for flexibility by allowing them to book within-day products. To further proactively enhance its product portfolio for the benefit of its transport customers, TAG GmbH has since October 2015 allowed gas

[4] Regulation (EU) 459/2017, which entered into force on 6 April 2017.

to be directed into the Slovak transmission system on a virtual interruptible basis via the TAG Baumgarten exit point (non-physical reverse flow on interruptible basis).

Building success through customer relationships.

In 2017, TAG GmbH began a cross-departmental initiative to analyse customer satisfaction. The aim is to continually evaluate and improve the quality of the customer services the company offers, with a particular focus on maintaining the already high quality of its account management activities. The central tool here is a market survey, which was carried out between 12 April and 12 May 2017 and the results of which will be used to develop performance and management indicators.

The final analysis of the survey's findings and a list of corresponding measures will be available by the end of 2017. The resulting action will then be taken in the period until the end of 2020.

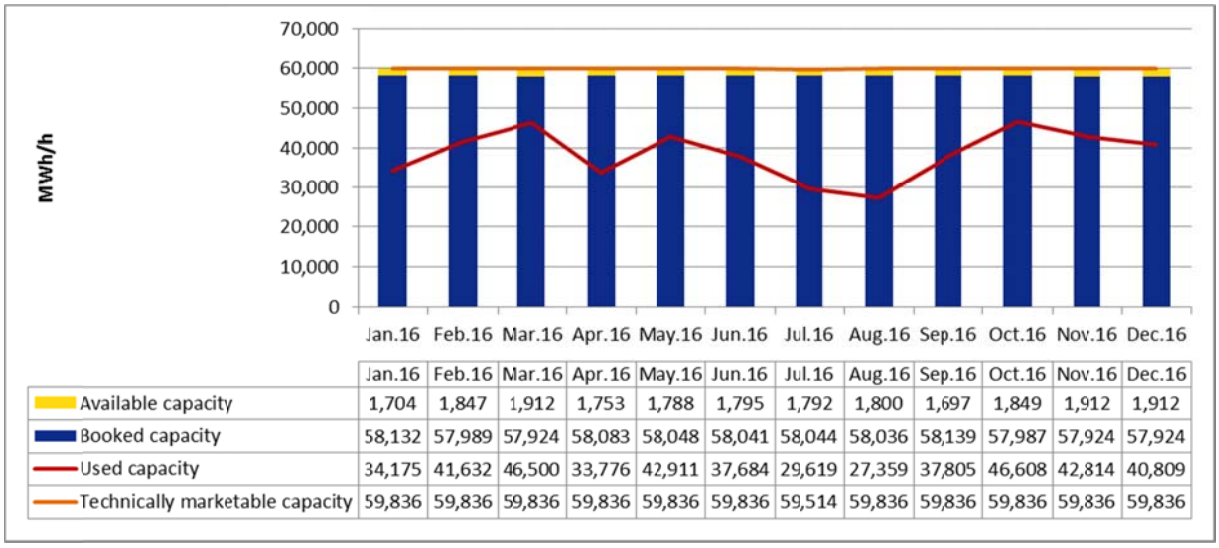
6.2 Capacity marketing – 2016 report

As in 2015, demand from market participants in the TAG system in 2016 was principally for short-term products, day-ahead products in particular. The fact that in a large number of auctions the starting price is the same as the market clearing price is a clear indication that there is no congestion in the TAG system and thus that the capacity offered is currently sufficient to cover market demand. Furthermore, the introduction in 2013 of short-term congestion management procedures in accordance with section 11 of the Gas-Marktmodell-Verordnung (Gas Market Model Ordinance, GMMO-VO) 2012 and the possibility of capacity surrender led to an increase in available freely allocable capacities at the relevant points. By introducing within-day auctions, TAG GmbH has implemented the provisions of Regulation (EU) 984/2013 (formerly the CAM Network Code) in full.

Chart 21 to Chart 23 show technically marketable capacity, available capacity, booked capacity and used capacity for each point and direction determined in accordance with the approved capacity calculation model from 1 January 2016 to 31 December 2016.

Fluctuations in technically marketable capacity are attributable to maintenance work that restricts capacity. An updated maintenance plan is available on TAG's website at **link**.

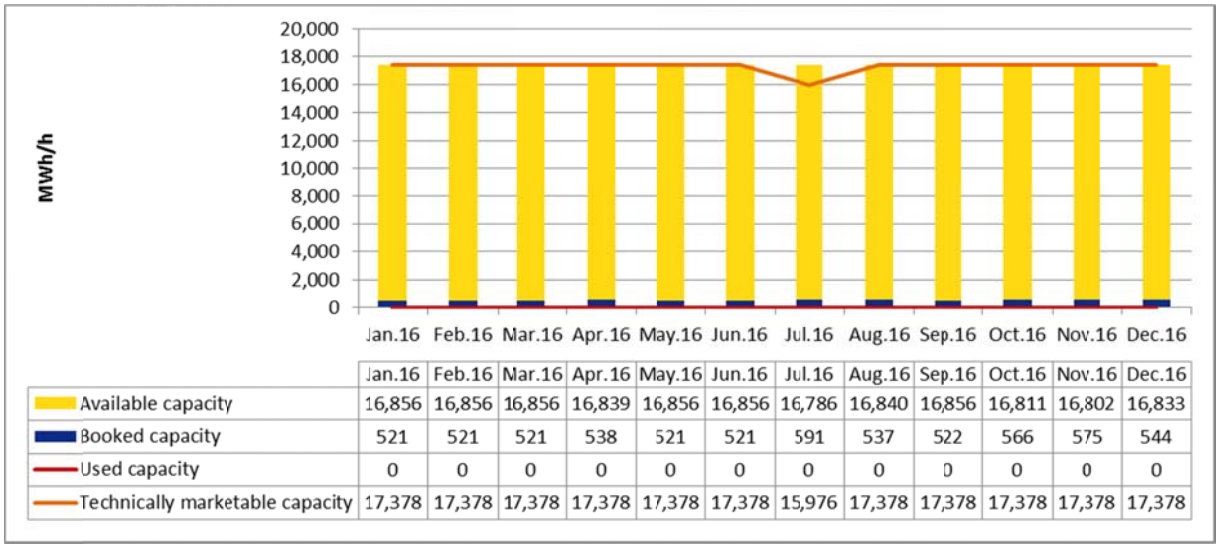
Chart 21: Capacity 2016 - BAUMGARTEN TAG ENTRY POINT



	Jan.16	Feb.16	Mar.16	Apr.16	May.16	Jun.16	Jul.16	Aug.16	Sep.16	Oct.16	Nov.16	Dec.16
Available capacity	1,704	1,847	1,912	1,753	1,788	1,795	1,792	1,800	1,697	1,849	1,912	1,912
Booked capacity	58,132	57,989	57,924	58,083	58,048	58,041	58,044	58,036	58,139	57,987	57,924	57,924
Used capacity	34,175	41,632	46,500	33,776	42,911	37,684	29,619	27,359	37,805	46,608	42,814	40,809
Technically marketable capacity	59,836	59,836	59,836	59,836	59,836	59,836	59,514	59,836	59,836	59,836	59,836	59,836

Source: TAG; 2017

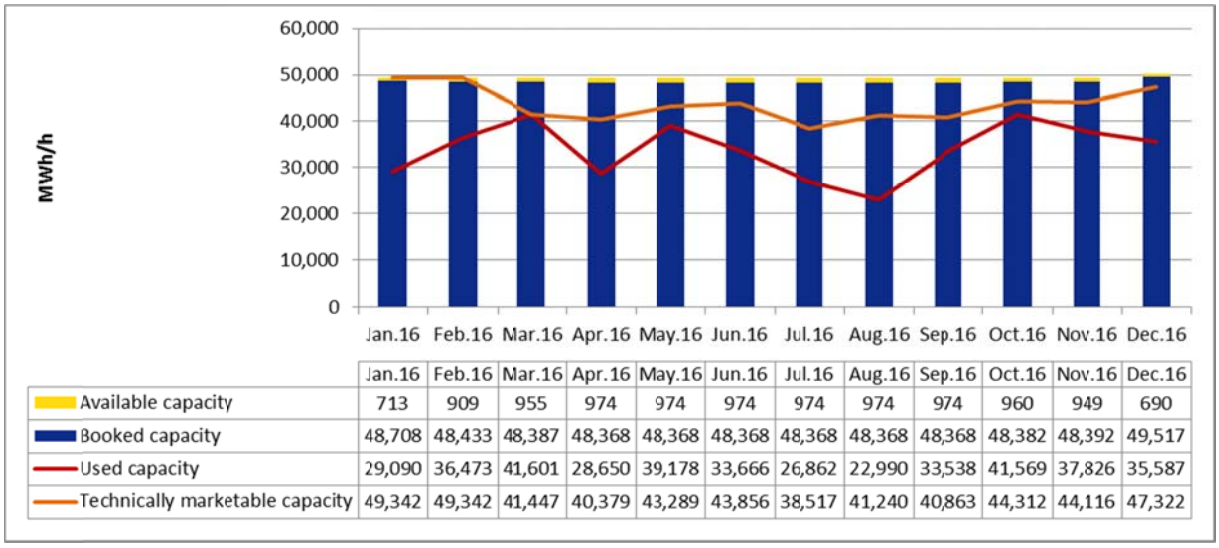
Chart 22: Capacity 2016 - ARNOLDSTEIN ENTRY POINT



	Jan.16	Feb.16	Mar.16	Apr.16	May.16	Jun.16	Jul.16	Aug.16	Sep.16	Oct.16	Nov.16	Dec.16
Available capacity	16,856	16,856	16,856	16,839	16,856	16,856	16,786	16,840	16,856	16,811	16,802	16,833
Booked capacity	521	521	521	538	521	521	591	537	522	566	575	544
Used capacity	0	0	0	0	0	0	0	0	0	0	0	0
Technically marketable capacity	17,378	17,378	17,378	17,378	17,378	17,378	15,976	17,378	17,378	17,378	17,378	17,378

Source: TAG; 2017

Chart 23: Capacity 2016 - ARNOLDSTEIN EXIT POINT



	Jan.16	Feb.16	Mar.16	Apr.16	May.16	Jun.16	Jul.16	Aug.16	Sep.16	Oct.16	Nov.16	Dec.16
Available capacity	713	909	955	974	974	974	974	974	974	960	949	690
Booked capacity	48,708	48,433	48,387	48,368	48,368	48,368	48,368	48,368	48,368	48,382	48,392	49,517
Used capacity	29,090	36,473	41,601	28,650	39,178	33,666	26,862	22,990	33,538	41,569	37,826	35,587
Technically marketable capacity	49,342	49,342	41,447	40,379	43,289	43,856	38,517	41,240	40,863	44,312	44,116	47,322

Source: TAG; 2017

6.3 Demand as the basis for the plan

As in previous years and in accordance with Article 26 of the CAM Network Code (in force since 6 April 2017), a non-binding survey of existing and potential system users was conducted to determine additional capacity demand for the current ten-year planning period for the Network Development Plan of TAG GmbH in conjunction with the 2018-2027 CNDP. In accordance with its statutory obligations and in coordination with GAS CONNECT AUSTRIA (GCA), TAG GmbH announced the start of its non-binding capacity demand survey on its website. For the purposes of transparency and the largest possible reach, the market survey was also announced on PRISMA and all users of the auction platform were invited to participate via the PRISMA newsletter.

The survey results and the resulting load-flow scenarios are presented later in the report, and are also available in the form of a "demand assessment report" for each entry/exit point in accordance with Article 26 of the CAM Network Code at this **link** on the TAG GmbH website.

In the capacity demand survey, existing and potential system users of the TAG system were asked to report non-binding additional capacity demand for the 2018-2027 period at the (relevant) physical Baumgarten or Arnoldstein (reverse flow) entry points as well as the Arnoldstein exit point and the Baumgarten virtual exit point. No additional demand was reported to TAG GmbH during the capacity demand survey by the reference date" of 1 June 2017.

TAG GmbH also carried out a project data collection, in which project sponsors were invited to report their projects to TAG GmbH. No projects were submitted to TAG GmbH. Capacity demand and projects can be reported even after the survey closing dates. Any such reports will be included in the next NDP.

Consequently, the data for the entry and exit points into and out of the TAG system are as follows:

Table 9: Results of 2017 survey

Current demand for capacity with access to the VTP				
	Physical entry points		Physical exit points	Non-physical exit points
	Baumgarten TAG (border to Slovakia)	Arnoldstein (border to Italy, interruptible capacities)	Arnoldstein (border to Italy)	Baumgarten TAG (border to Slovakia, interruptible capacities)
Demand [kWh/h] on 1 June 2017	0	0	0	0

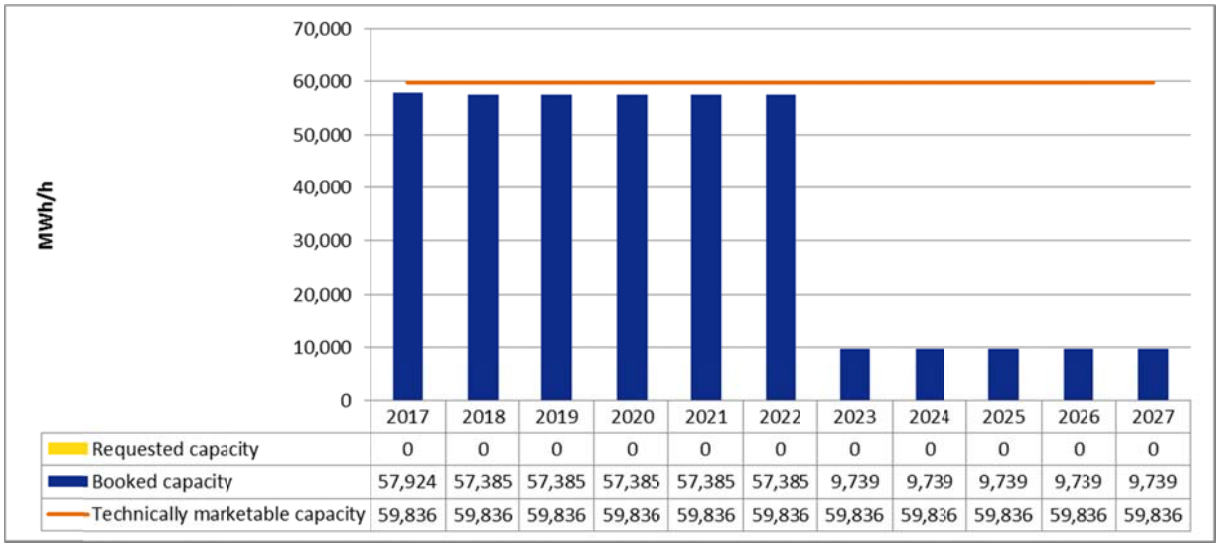
Current demand for capacity without access to the VTP			
	Physical entry points	Physical exit points	Non-physical exit points
	Arnoldstein (border to Italy, dynamically allocated capacities)	-	-
Demand [kWh/h] on 1 June 2017	0	0	0

Source: TAG; 2017

Based on the results of the capacity demand survey, TAG GmbH drew up a capacity analysis for the period 2018-2027 which takes into account the following parameters:

- Technical capacity at the Baumgarten and Arnoldstein entry and exit points
- Booked capacity at the Baumgarten and Arnoldstein entry and exit points

Chart 24: Capacity demand survey 2017 - BAUMGARTEN ENTRY POINT

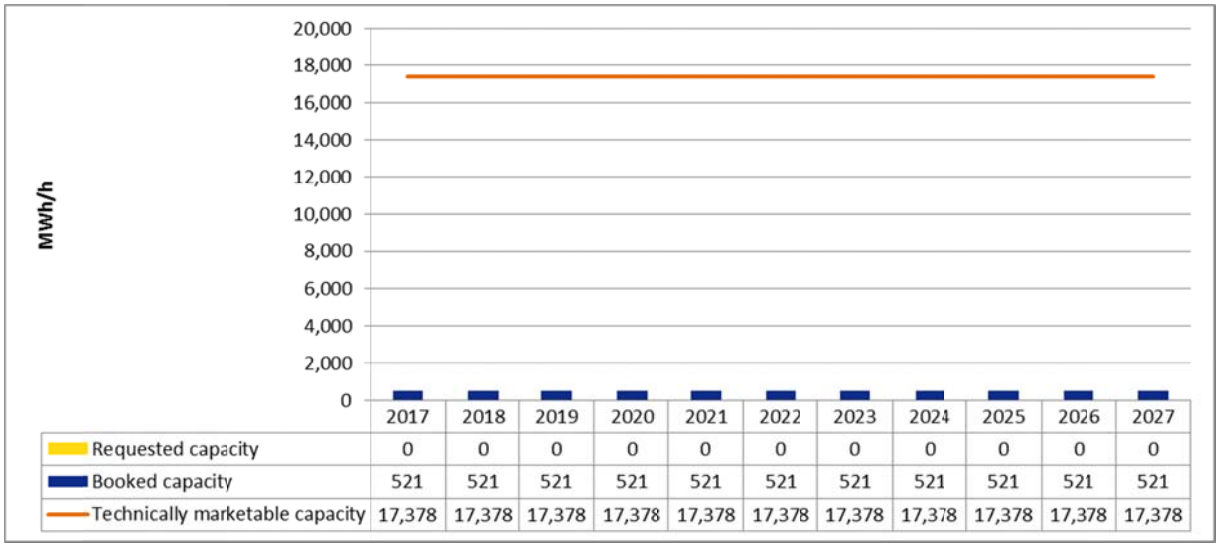


	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Requested capacity	0	0	0	0	0	0	0	0	0	0	0
Booked capacity	57,924	57,385	57,385	57,385	57,385	57,385	9,739	9,739	9,739	9,739	9,739
Technically marketable capacity	59,836	59,836	59,836	59,836	59,836	59,836	59,836	59,836	59,836	59,836	59,836

Source: TAG; 2017

The diagram shows that both the technical as well as the booked capacity at the Baumgarten entry point will remain steady from 2018 to 2022. The freely allocable capacity will slightly increase in the period from 2017 to 2018 due to changes in the contract terms with one system user. As several long-term contracts will expire, the available free capacity will increase significantly from 2023.

Chart 25: Capacity demand survey 2017 - ARNOLDSTEIN ENTRY POINT

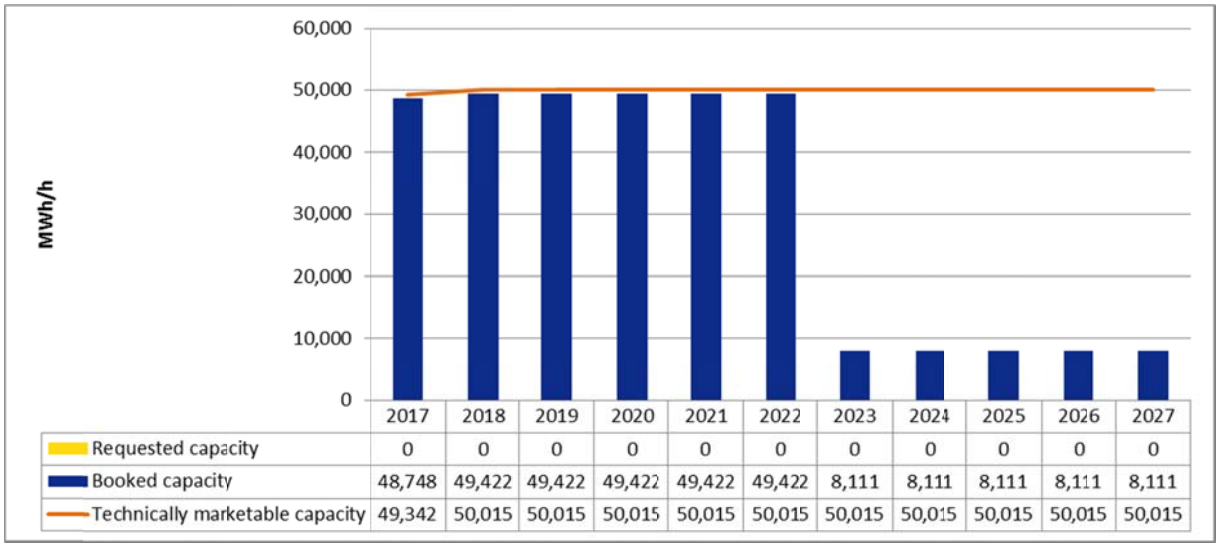


	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Requested capacity	0	0	0	0	0	0	0	0	0	0	0
Booked capacity	521	521	521	521	521	521	521	521	521	521	521
Technically marketable capacity	17,378	17,378	17,378	17,378	17,378	17,378	17,378	17,378	17,378	17,378	17,378

Source: TAG; 2017

The chart shows that both the technical as well as the booked capacity at the Arnoldstein entry point will remain constant from 2018 up to 2027.

Chart 26: Capacity demand survey 2017 - ARNOLDSTEIN EXIT POINT



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Requested capacity	0	0	0	0	0	0	0	0	0	0	0
Booked capacity	48,748	49,422	49,422	49,422	49,422	49,422	8,111	8,111	8,111	8,111	8,111
Technically marketable capacity	49,342	50,015	50,015	50,015	50,015	50,015	50,015	50,015	50,015	50,015	50,015

Source: TAG; 2017

The technical as well as the booked capacity at the Arnoldstein exit point will remain constant from 2018 to 2022. The slight increase in technical exit capacity in the period from 2017 to 2018 results from a change in contract terms with one system user. Similar to the Baumgarten entry point, free capacity will increase markedly from 2023 as a result of the expiry of long-term contracts spanning several years.

6.4 Development of the TAG pipeline system

6.4.1 Conditions laid down in the official decision approving the 2016 CNDP

Clause 2.b. of the official decision V KNEP G 01/16 of 23 September 2016 required the TSOs to notify the authority of the interconnection capacities from the TAG system to the GCA system and vice versa generated at the Baumgarten point by technical measures. TAG GmbH, working closely with GCA, complied with this condition at the end of 2016 by submit-ting transparent information on interconnection capacities between the two systems. Analysis of further potential for optimisation is a key element in the cooperation between the TSOs and is carried out on a project-by-project basis in the course of the CNDP preparation process and other planning activities.

To satisfy another condition imposed in the same official decision, scenarios and analyses regarding the effects of the ratio of electrical to gas compressor power were drawn up by the market area manager and the TSOs working in coordination. The results were presented at the beginning of this report.

6.4.2 Development projects

The following individual projects were analysed and developed in close cooperation with the Austrian TSO GCA and the relevant adjacent TSOs. The following chapters describe the individual projects, analyse possibilities for integration into the European plan, present marketing concepts and describe national and international coordination activities as regards project planning. The conditions imposed in official decision V KNEP G 01/16 of 23 September 2016 were also used as a basis for analysis.

Details of the projects, including technical measures, are given at the end of this report in the form of project data sheets. Further information is provided to the regulatory authority separately in confidential attachments.

The table below gives an overview of the status of the various projects:

Table 10: List of development projects of TAG GmbH

No.	Project	Planned completion / implementation period	Status	Possible impact on availability of transport capacities during implementation (Yes/No)
Projects implemented				
TAG 2015/01	Baumgarten Metering Routes, TAG Integration	24 October 2016	Completed	
Monitoring of projects already approved				
TAG 2016/02	AZ1 Additional Entry and Connection with BOP 13	Q3/2018	Implementation	Y
TAG 2016/04	TAG Baumgarten Interconnection Capacity (Mosonmagyaróvár)	Q4/2021	Planning	N
Monitoring of projects already approved - with updates				
TAG 2016/01	TAG Reverse Flow Weitendorf/Eggendorf	Q4/2019	Planning	Y
TAG 2016/03	Reverse Flow Baumgarten MT Station (MS2)	3.5 years	Planning	Y
TAG 2016/05	TAG Baumgarten Interconnection Capacity (BACI)	4.5 years	Planning	Y
Withdrawn projects				
TAG 2016/06	TAG Baumgarten Interconnection Capacity (BBI)		on hold	
New projects				
TAG 2017/01	TAG Baumgarten Interconnection Capacity (Mosonmagyaróvár) II	4.5 years	Planning	Y[5]

6.4.3 Replacement investment projects

The table below gives an overview of the individual replacement investment projects. Details of the projects, including technical measures, are given at the end of this report in the form of project data sheets. Further information is provided to the regulatory authority separately in confidential attachments.

The re-investment projects are syntactically marked with the character „R“ for re-investment for the sake of an easier identification and better readiness. This rule will be also used for re-investment projects already approved in the precedent years[6]. Accordingly:

- the denomination „TAG 2015/R03“ will be used instead of „TAG 2015/03“.
- the denomination „TAG 2015/R04“ will be used instead of „TAG 2015/04“.
- the denomination „TAG 2016/R07“ will be used instead of „TAG 2016/07“.
- the denomination „TAG 2016/R08“ will be used instead of „TAG 2016/08“.
- the denomination „TAG 2016/R09“ will be used instead of „TAG 2016/09“.
- the denomination „TAG 2016/R10“ will be used instead of „TAG 2016/10“.
- the denomination „TAG 2016/R11“ will be used instead of „TAG 2016/11“.
- the denomination „TAG 2016/R12“ will be used instead of „TAG 2016/12“.

[5] Possible impact on availability of interconnection capacities at the MS4 connection during implementation, depending on the technical concept

[6] This pure syntactical and user-oriented adaptation can in no circumstances be interpreted as a content-wise project change or update. This pure syntactical and user-oriented adaptation cannot be used as basis for a re-interpretation of the relevant KNEP approvals and validity already issued by E-Control to the KNEP-projects.

Table 11: List of replacement investment projects of TAG GmbH

No.	Project	Planned completion:	Status	Possible impact on availability of transport capacities during implementation (Yes/No)
Projects implemented				
TAG 2015/R03	US Flow Meters ARN-BMGT	21 December 2016	Completed	
Monitoring of projects already approved				
TAG 2016/R07	DLE 1.5 +72 Holes PT Module RC500 in CS Ruden	Q4/2017	Execution	N
Monitoring of projects already approved - with updats				
TAG 2016/R04	NOxER II	Q4/2018	Execution	
TAG 2016/R08	Major Overhaul Renewal of Valve Stations, Orth/Kaindorf/Finkenstein	Q4/2017	Execution	N
TAG 2016/R09	Exchange Leaking Valves St. Paul/ Ruden/ Arnoldstein/ Ludmannsdorf	Q4/2019	Execution	Y
TAG 2016/R10	Renewal Low-Voltage Main Switch Gear, CS-Grafendorf	Q4/2017	Execution	Y
TAG 2016/R11	Replacement of Gashydraulic Actuators, CS-Baumgarten, Grafendorf and Ruden	Q4/2021	Planning	N
TAG 2016/R12	SCS Replacement, CS Ruden–Grafendorf-Baumgarten	Q4/2021	Engineering	Y
Withdrawn projects				
New projects				
TAG 2017/R01	Refurbishment MS2	Q4/2019	Planning	N
TAG 2017/R02	Major Overhaul Renewal of Valve Stations, Lichtenegg/Wielfresen 1/Ettendorf/Ludmannsdorf	Q4/2019	Planning	N
TAG 2017/R03	Major Overhaul Renewal of Valve Stations Lanzenkirchen/Sulmeck/ St.Paul/ Ruden / Arnoldstein	Q4/2019	Planning	N
TAG 2017/R04	CS Baumgarten Grafendorf Ruden Substitution Gas Hydraulic Actuators TUCO	Q4/2019	Planning	N
TAG 2017/R05	Baumgarten Filter Separators & metering station MS2 Electrical Actuators	Q4/2019	Planning	N
TAG 2017/R06	DLE 1.5 + 72 Hole PT Module RC400 in CS-Ruden	Q4/2018	Execution	N
TAG 2017/R07	Gas Generator BC800 in CS-Baumgarten	Q1/2019	Engineering	N
TAG 2017/R08	Gas Generator RC600 in CS-Ruden	Q4/2019	Engineering	N
TAG 2017/R10	Sec.3: Replacement of TAG I Damaged Insulation	Q4/2017	Execution	N
TAG 2017/R11	Sec.1: Refurbishment Sec Ball Valve SS1 (Orth)	Q3/2017	Execution	N[7]
TAG 2017/R12	CS-E: Repl. Insulation Joint Loop2	Q3/2017	Execution	Y

[7] Due to coordination with the NOxER II project at the Baumgarten CS that there is no additional reduction in technical capacity.

6.5 Submission of new and updated development projects and monitoring (2018-27 CNDP)

6.5.1 Messstrecken Baumgarten TAG Einbindung [TAG 2015/01]

The "Messstrecken Baumgarten TAG Einbindung" project was initiated due to changes in gas flows during the 2014/15 gas half year and the resultant requirements concerning inter-connection between the transmission systems in the Baumgarten facility. The project was submitted in 2015 for inclusion in the 2016-2025 CNDP and is a complementary measure to the Baumgarten Metering Routes project (GCA 2015/09) submitted by GCA for inclusion in the 2016-2025 CNDP.

The rationale for the project included the following considerations:
- Response to changing market requirements
- Optimised interconnection of the Baumgarten node
- Setting up new and improved routes
- Reduced dependency on non-Austrian TSOs
- Enhanced security of supply of Austrian and Italian markets
- Lower probability of interruption of interruptible services

The project was completed on 24 October 2016. The options for interconnection between the TAG and GCA systems at Baumgarten are now fully available. Commissioning of the project achieved the objectives set.

6.5.2 TAG Reverse Flow Weitendorf/Eggendorf [TAG 2016/01]

Basis: Capacity upgraded to FZK quality and security of supply: The project fulfils the obligation imposed in the official decision V KNEP G 01/15 of 27 October 2015 issued by ECA in respect of the 2016-2025 CNDP. In conjunction with the GCA 2015/10 and TAG 2016/02 project, it will create new and non-competing freely allocable capacity at the Arnoldstein and Murfeld entry points.

Capacities at the Arnoldstein and Murfeld entry points: The project will permit flow at the Weitendorf CS to be reversed to allow the existing entry capacity at Arnoldstein and the planned new capacity at Murfeld to be transported towards Baumgarten while also fulfilling all contractual obligations at the domestic exit points. The project also involves a number of minor changes at the TAG CS to permit reverse flow under normal operating conditions with no need for intervention on site.

Implementation of the TAG 2016/01 TAG Reverse Flow Weitendorf/Eggendorf project, which comprises operation of the Weitendorf CS and all necessary modifications to the station control system, will guarantee physical transport of at least 17,904,000 kWh/h (1,600,000 Nm³/h, 0°C), i.e. at least 11,190,000 kWh/h (1,000,000 Nm³/h, 0°C) at the Arnoldstein entry point and 6,714,000 kWh/h (600,000 Nm³/h, 0°C) at the Murfeld entry point. The project will also enable physical operation from the Murfeld entry point towards Italy via the SOL and TAG systems, even if this is currently highly unlikely.

Coordination with adjacent TSOs: Coordination at operational level was largely carried out between TAG GmbH and GCA in 2016. In connection with the results of the market test planned by GCA and Plinovodi (for flow direction from Austria to Slovenia) at the Austrian-Slovenian border and the corresponding future project configurations (see GCA 2015/08), and because to

date no capacity demand at the Baumgarten entry point has been reported to TAG GmbH, there is currently no need to take any action. If any capacity demand is reported, TAG GmbH, in cooperation with GCA, will take the necessary action and if appropriate will conduct a feasibility study evaluating potentially necessary adaptations to the TAG system between Baumgarten and Weitendorf (including costs, schedule).

Concepts for capacity allocation: The project, in combination with the GCA 2015/10 and TAG 2016/02 projects, will allow the existing DZK capacities to be upgraded to FZK capacities at the Arnoldstein entry point, and will be a major milestone in ensuring full reverse flow across the TAG system. When these complementary projects are complete, the relevant capacity at the Arnoldstein entry point will be marketed as upgraded freely allocable capacity.

Included in European plan: Since 28 April 2017, this project has officially been part of the 2017 TYNDP (TRA-N-954). Project TAG 2016/01, together with the TAG 2016/02 and TAG 2016/03 projects, aims to improve local security of supply through diversification of supply routes and sources of supply and the enhanced access from Italy that this will produce. By enabling additional possibilities for physical reverse flow to be offered in the south-north and south-east directions, this project will foster the north-south-east corridor and as such is of interest for the Austrian market area.

Previously approved in the 2017-2026 NDP and monitoring: Project TAG 2016/01 was previously approved in the 2016-2025 CNDP. The project is within budget and is currently in the planning phase. Because of re-planning, the project implementation is currently planned for 2019. The update of the planning project is submitted for approval under the terms specified in the economic data section.

6.5.3 AZ1 Additional Entry and Connection with BOP 13

Basis: Increased flexibility between the TAG, GCA and distribution systems: The project will increase the interconnection capacity from the GCA system to the TAG system to ensure the principle of free allocability of the projected additional capacities and capacities upgraded to FZK quality as a result of projects GCA 2015/7b, GCA 2015/02a, GCA 2016/02, GCA 2015/08, GCA 2015/10 and TAG 2016/01.

Increased interconnection capacities between the TAG and GCA systems: The project objective is the ensure additional capacity at the AZ1 entry point from the GCA system, like it is stated in the GCA 2015/7b project, which will bring the entire 1,200,000 Nm^3/h from AZ1 to the low-pressure side of the TAG Baumgarten CS. As it includes a direct connection between BOP13 and the AZ1 medium-pressure line, TAG 2016/02 will also involve additional technical improvements to alleviate congestion between the distribution area and the transmission system.

Coordination with adjacent TSOs: Coordinated planning discussions were largely carried out between TAG GmbH and GCA in 2016. The coordination between the TSOs as necessary for the construction works is ensured.

Previously approved in the 2017-2026 NDP and monitoring: Project TAG 2016/02 was previously approved in the 2017-2026 CNDP. The project is within budget and on schedule.

6.5.4 Reverse Flow Baumgarten MT Station (MS2) [TAG 2016/03]

Basis: Security of supply: As described in the 2017-2026 CNDP, the TAG 2016/03 project will facilitate physical reverse flow in the TAG system towards the Slovak network, which will improve security of supply in the region as a whole.

Additional capacity at the Baumgarten exit point: At present, the ENTSOG Transparency Platform reports firm exit capacities of 10,272,000 kWh/h (917,962 Nm³/h, 0°C) at Baumgarten. The objective of the TAG 2016/03 project is to create up to 1,000,000 Nm³/h of additionally freely allocable exit capacities at Baumgarten and so create a new TAG exit point at the Austrian/Slovak border.

Coordination with adjacent TSOs: To enable additional freely allocable capacity at the Baumgarten exit point, TAG GmbH is in constant consultation with the Slovak TSO eustream a.s. with the aim of further analysing and defining the capacity allocation methods and technical requirements for the project. TAG GmbH and eustream a.s. have shared information on the technical and commercial details of the project on a number of occasions since mid-2016. The domestic interconnection situation between the Austrian transmission system operators was analysed and taken into account. Based on the last coordination between the involved transmission system operators, the potentiality of the TAG 2016/03 project has been also reconsidered under the functional input of the project GCA 2016/E2.

Concepts for capacity allocation: The economic viability of the project is to be assessed.

Included in European plan: Since 28 April 2017, this project has officially been part of the 2017 TYNDP (TRA-N-954). Project TAG 2016/03, together with the TAG 2016/01 and TAG 2016/02 projects, are all intended to improve local security of supply through diversification of supply routes and sources of supply along the Italy-Austria-Slovakia route. By enabling additional possibilities for physical reverse flow to be offered, predominantly in the south-north and south-east directions, this project will foster the north-south corridor and as such is of interest for the Austrian market area.

Previously approved in the 2017-2026 NDP and monitoring: Project TAG 2016/03 was previously approved as new project subject to conditions in the 2017-2026 CNDP. Based on the consideration of the other existing related project and its respective advancement, the project is re-submitted for approval as planning project under the terms specified in the economic data section. It is estimated that implementation of TAG 2016/03 will take indicatively 3,5 years, to be considered after a positive economic viability test of the project and final investment decision. Currently the project is in the planning phase.

6.5.5 TAG Baumgarten interconnection capacity (Mosonmagyaróvár) [TAG 2016/04]

Basis: Non-binding demand reported to GCA and intra-Austrian interconnection capacity: Project TAG 2016/04, as a complementary project to the GCA 2015/05 project, will create additional interconnection capacity at Baumgarten based on additional FZK capacity at the GCA Mosonmagyaróvár entry point (see GCA NDP). The project will ensure modification of the TAG Baumgarten station to enable increased gas flow into the TAG system and guarantee access to the VTP. The project is needed to increase technical interconnection capacity between the TAG GmbH and GCA transit systems within the Baumgarten station and also to improve security of

supply in the Austrian and Hungarian markets. The increase in interconnection capacities will improve the liquidity of the European markets and enhance security of supply in Austria and Europe by enabling alternative transport routes for alternative sources of gas supply.

Additional capacity at the Mosonmagyaróvár entry point. The project does not itself guarantee the creation of new capacities at the relevant points, but it does create the conditions for guaranteed access to the VTP, so permitting additional FZK capacity at the entry and exit points of the Eastern market area in Austria. Non-binding additional capacity demand for a maximum of 5,113,000 kWh/h or 453.927 Nm³/h (0°C) at the Mosonmagyaróvár entry point was reported in the GCA NDP (see the GCA 2015/05 project for further details).

Concepts for capacity allocation: As the additional interconnection capacity does not influence capacities at the relevant points in the TAG system, TAG GmbH will not carry out any capacity allocation.

Coordination with adjacent TSOs. TAG GmbH and GCA continued to coordinate with each other on detailed project planning, based on additional technical capacities of 6,378,000 kWh/h or 570,000 Nm³/h (0°C). Depending on implementation of the TAG 2016/02 project, the schedule for the GCA 2015/05 project and the outcome of the measures relating to the envisaged creation of additional capacity offers on a freely allocable capacity basis undertaken by the Austrian and Hungarian TSOs directly involved, there will be further analysis of the need for implementation of the TAG 2016/04 project.

Previously approved in the 2017-2026 NDP and monitoring: Project GCA 2016/04 was previously approved as planning project in the 2017-2026 CNDP. Currently the project is in the planning phase.

6.5.6 TAG Baumgarten Interconnection Capacity (BACI) [TAG 2016/05]

Basis: Non-binding demand reported to GCA and intra-Austrian interconnection capacity: Project TAG 2016/05, as a complementary project to the GCA 2015/01a project, will create additional interconnection capacity at Baumgarten based on additional FZK capacity at the planned Reintal entry/exit point between the Austrian GCA system and the Czech N4G system (see GCA NDP). The project will ensure modification of the TAG Baumgarten station to enable increased gas flow into the TAG system and guarantee access to the VTP. The project is needed to increase technical interconnection capacity between the TAG GmbH and GCA transit systems within the Baumgarten station and also to improve security of supply in the Austrian and Czech markets. The increase in interconnection capacities will improve liquidity of the European markets and enhance security of supply in Austria and Europe by strengthening alternative transport routes for alternative sources of gas supply.

Additional capacity at the Reintal exit/entry point: The TAG 2016/05 project does not itself guarantee the creation of new capacities at the relevant points, but it does create the conditions for guaranteed access to the VTP, so permitting additional FZK capacity at the entry and exit points of the Eastern market area in Austria. Non-binding additional bidirectional capacity demand for a maximum of 8,392,500 kWh/h or 750,000 Nm³/h (0°C) at the Reintal entry/exit point was submitted for inclusion in the GCA NDP.

Concepts for capacity allocation: As the additional interconnection capacity does not influence capacities at the relevant points in the TAG system, TAG GmbH will not carry out any capacity allocation.

Coordination with adjacent TSOs: TAG GmbH and GCA continued to coordinate with each other on detailed project planning. Based on the coordination between the transmission system operators TAG GmbH and GCA and the dependency between the TAG 2016/05 project and the complementary GCA 2015/01a project, it is estimated that implementation of planning TAG 2016/05 will take a maximum of 4.5 years, beginning in 2018 if possible and subject to approval by the relevant authorities.

Previously approved in the 2017-2026 NDP: Project TAG 2016/05 was approved as a planning project in the 2017-2026 CNDP subject to the condition that GCA and/or TAG GmbH in consultation with the market area manager and prior to the final investment decision or, in the case of planning projects at the latest in the 2018 CNDP, optimise the technical and economic efficiency of the planned measures. Currently the project is in the planning phase and will be carried on as implementation project in adequacy with the complementary project GCA 2015/01a. The amendment of the project is submitted for approval under the terms specified in the economic data section.

6.5.7 TAG Baumgarten Interconnection Capacity (BBI) [TAG 2016/06]

Basis: Non-binding GCA demand and intra-Austrian interconnection capacity: Project TAG 2016/06, as a complementary project to the GCA 2016/01 project, will create additional interconnection capacity at Baumgarten based on additional FZK capacity at the planned Reintal entry point into the GCA system (see GCA NDP). The project will ensure modification of the TAG Baumgarten station to enable increased gas flow into the TAG system and guarantee access to the VTP. The project is needed to increase technical interconnection capacity between the TAG GmbH and GCA transit systems within the Baumgarten station and also to improve security of supply in the Austrian and Czech markets. The increase in interconnection capacities will improve liquidity of the European markets and enhance security of supply in Austria and Europe by strengthening alternative transport routes for alternative sources of gas supply.

Additional capacity at the Reintal exit/entry point: The project does not itself guarantee the creation of new capacities at the relevant points, but it does create the conditions for guaranteed access to the VTP, so permitting additional FZK capacity at the entry and exit points of the Eastern market area in Austria. Non-binding additional demand for a maximum of 53,106,000 kWh/h or 4,745,833 Nm³/h (0°C) at the Reintal entry point was submitted for inclusion in the GCA NDP.

Previously approved in the 2017-2026 NDP and putting on hold: Project TAG 2016/06 was approved as a planning project in the 2017-2026 CNDP subject to the condition that GCA and/or TAG GmbH in consultation with the market area manager and prior to the final investment decision or, in the case of planning projects at the latest in the 2018 CNDP, optimise the technical and economic efficiency of the planned measures.

The project is directly linked to the GCA 2016/01 project. The project will be withdrawn (see GCA 2016/01 project for detailed information).

6.5.8 TAG Baumgarten Interconnection Capacity (Mosonmagyaróvár) [TAG 2017/01]

Basis: Non-binding GCA demand and intra-Austrian interconnection capacity: Project TAG 2017/01, as a complementary project to the GCA 2017/01 project, will create additional interconnection capacity at Baumgarten based on additional FZK capacity at the GCA Mosonmagyaróvár entry point (see GCA NDP). The project will ensure modification of the TAG Baumgarten station to enable increased gas flow into the TAG system and guarantee access to the VTP. The project is needed to increase technical interconnection capacity between the TAG GmbH and GCA transit systems within the Baumgarten station and also to improve security of supply in the Austrian and Hungarian markets. The increase in interconnection capacities will improve the liquidity of the European markets and enhance security of supply in Austria and Europe by enabling alternative transport routes for alternative sources of gas supply. This project is an alternative to TAG 2016/04.

Additional capacity at the Mosonmagyaróvár entry point: The project does not itself guarantee the creation of new capacities at the relevant points, but it does create the conditions for guaranteed access to the VTP, so permitting additional FZK capacity at the entry and exit points of the Eastern market area in Austria. Non-binding additional capacity demand for a maximum of 11,190,000 kWh/h or 1,000,000 Nm³/h (0°C) at the Mosonmagyaróvár entry point was reported in the GCA NDP.

Concepts for capacity allocation: As the additional interconnection capacity does not influence capacities at the relevant TAG GmbH points, TAG GmbH will not carry out any capacity allocation.

Coordination with adjacent TSOs: TAG GmbH and GCA initiated and continued coordination on detailed project planning during preparation of the 2017 CNDP. Based on the coordination between the transmission system operators TAG GmbH and GCA and the dependency between this project and the complementary GCA 2017/01 project, it is estimated that implementation will take a maximum of 4.5 years, beginning in 2018 if possible and subject to approval by the relevant authorities.

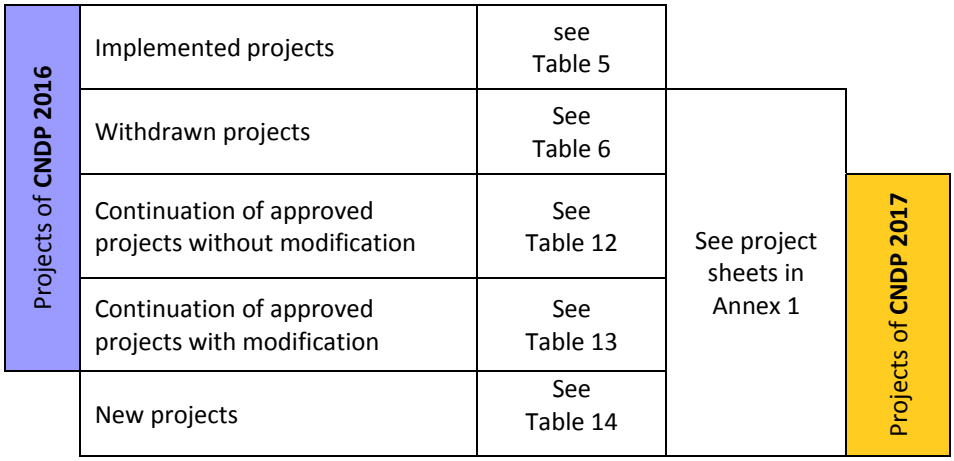
Submitted for approval in the 2018-2027 NDP: The TAG 2017/01 project is submitted as a planning project during the submission phase for the 2018-2027 CNDP, in adequacy with the complementary project GCA 2017/01.
Currently the project is in the planning phase

7 Projects

Project classification

Project classification is shown in Chart 27. The tables and Annex 1 list both the projects for incremental capacities and replacement investment projects but labels them accordingly.

Chart 27: Project classification



Source: AGGM; 2017

Projects in the 2017 CNDP

The 2017 CNDP includes the projects listed in Table 12, Table 13 and in Table 14.

Table 12 lists the projects that were included in the 2015 CNDP and the 2016 CNDP and are continued without modification. These projects were previously approved by E-Control Austria and are continued by the project sponsors according to the implementation plan.

Table 13 lists those projects that were approved in an earlier KNEP by E-Control Austria, but modified on the basis of new knowledge or changed needs. E-Control Austria is requested to reapprove these projects with the modifications.

Table 14 lists the projects newly created in KNEP 2017. These projects are submitted to E-Control Austria for approval.

For the sake of clarity, the projects are classified into two categories in the project type column. Projects marked with K aim to meet the capacity demand shown in chapter 4. Projects marked with E are replacement investment projects.

The project sheets containing the essential project data are attached in Annex 1. The projects are listed by project number.

Table 12: Continuation of approved projects without modification

Project-sponsor	Project-typ*)	Poject-number	Projectname	Implementation time frame [years]	Planned completition [date]
Continuation of approved projects without modification					
GCA	IC	2015/01b	Projekt 1b: BACI DN 1200	4.25	
GCA	IC	2015/03	Entry/Exit Überackern - Maximum	6	
GCA	R	2016/E2	MS3 Reverse Flow		Q2 2019
GCA	R	2016/E4	Baumgarten MS3 & Oberkappel – Switch from orifice to ultrasound metering		Q4 2019
TAG	IC	2016/02	AZ1 additional entry and connection with BOP13		Q3 2018
TAG	IC	2016/04	TAG Baumgarten interconnection capacity (Mosonmagyaróvár)		Q4 2021
TAG	R	2016/R07	DLE 1.5 + 72 holes PT module RC500 in CS Ruden		Q4 2017
*) IC - Project for incremental capacities; R - replacement investment project					

Source: GCA, TAG, AGGM; 2017

Table 13: Continuation of approved projects with modification

Project-sponsor	Project-typ*)	Poject-number	Projectname	Implementation time frame [years]	Planned completition [date]
Continuation of approved projects with modification					
GCA	IC	2015/01a	Bidirectional Austria Czech Interconnector	4.5	
GCA	IC	2015/02a	Entry Überackern	4.5	
GCA	IC	2015/04	Entry Mosonmagyaróvár - Minimum	1.5	
GCA	IC	2015/05	Entry Mosonmagyarovar	4.5	
GCA	IC	2015/07b	Additional Demand in Distribution Area +		Q1 2018
GCA	IC	2015/08	Entry/Exit Murfeld	4.5	
GCA	IC	2015/10	Entry Arnoldstein		Q3 2018
GCA	R	2016/E1	110 kV Overhead Power Line		Q4 2021
GCA	R	2016/E5	Revamp Oberkappel		Q1 2020
TAG	R	2015/R04	NOxER II		Q4 2018
TAG	IC	2016/01	TAG Reverse Flow Weitendorf/Eggendorf		Q4 2019
TAG	IC	2016/03	Reverse Flow Baumgarten MT Station (MS2)	3.5	
TAG	IC	2016/05	TAG Baumgarten interconnection capacity (BACI)	4.5	
TAG	R	2016/R08	Major Overall Renewal of Gate Valve Stations Orth/Kaindorf/Finkenstein		Q4 2017
TAG	R	2016/R09	Exchange Leaking Valves St. Paul/Rude/Ludmannsdorf/Arnoldstein		Q4 2019
TAG	R	2016/R10	Renewal Low-Voltage Main Switchgear Grafendorf		Q4 2017
TAG	R	2016/R11	Replacement of Gas-Hydraulic Actuators CS Baumgarten		Q4 2021
TAG	R	2016/R12	Exchange of Station Control System (SCS), CS Ruden-Grafendorf-Baumgarten		Q4 2021
*) IC - Project for incremental capacities; R - replacement investment project					

Source: GCA, TAG, AGGM; 2017

Table 14: New projects

Project-sponsor	Project-typ*)	Poject-number	Projectname	Implementation time frame [years]	Planned completition [date]
New Projects					
GCA	IC	2017/01	Entry Mosonmagyaróvár Plus	4.5	
GCA	IC	2017/02	Penta West – Exit Distribution Area	1.5	
GCA	R	2017/E4	Extension of Baumgarten Substation TAG NOxER II		Q3 2018
GCA	R	2017/E5	Replacement of Process Control System at the Rainbach Compressor Station		Q4 2019
GCA	R	2017/E6	SOL Revamp		Q4 2018
TAG	IC	2017/01	TAG Baumgarten interconnection capacity (Mosonmagyaróvár) II	4.5	
TAG	R	2017/R01	MS2 Refurbishment		Q4 2019
TAG	R	2017/R02	Major Overhaul Renewal of Valve Stations, Lichtenegg / Wielfresen 1 / Ettendorf / Ludmannsdorf		Q4 2019
TAG	R	2017/R03	Major Overhaul Renewal of Valve Stations Lanzenkirchen/ Sulmeck/ St.Paul/ Ruden/ Arnoldstein		Q4 2019
TAG	R	2017/R04	CS Baumgarten Grafendorf Ruden Substitution Gas Hydraulic Actuators TUCO		Q4 2019
TAG	R	2017/R05	Baumgarten Filter Separators & metering station MS2 Electrical Actuators		Q4 2019
TAG	R	2017/R06	DLE 1.5 + 72 hole PT module RC400 in CS-Ruden		Q4 2018
TAG	R	2017/R07	Gas Generator BC800 in CS-Baumgarten		Q1 2019
TAG	R	2017/R08	Gas Generator RC600 in CS-Ruden		Q4 2019
TAG	R	2017/R10	Sec.3: Replacement of TAG I damaged Insulation		Q4 2017
TAG	R	2017/R11	Sec.1: Refurbishment Sec Ball Valve SS1 (Orth)		Q3 2017
TAG	R	2017/R12	CS-E: Repl. Insulation Joint Loop2		Q3 2017

*) IC - Project for incremental capacities; R - replacement investment project

Source: GCA, TAG, AGGM; 2017

8 Appreciation of the statements from the consultation

After the publication of the KNEP in the consultation version (version 1.0), the TSO eustream, the German TSO bayernets and the OMV Gas & Power GmbH, had transmitted statements in time. The market area manager thanks for the transmitted statements

Eustream states in its statement that the project BACI of Gasconnect Austria GmbH including the complementary project of the TAG GmbH has to be deleted. Gas Connect Austria GmbH and the market area manager are aware of this, but does not share the opinion expressed. Rather, Gas Connect Austria GmbH and the market area manager are convinced of the positive potential of the projects. It is therefore not possible to take account of the proposal for the deletion of the projects, according to the opinion.

The bayernets proposes that existing infrastructure on the German side can be used for pressure support with regard to the project Entry Überackern GCA 2015/ 2a. In consultation with the FNB Gas Connect Austria GmbH, it has been assured that a corresponding analysis will be carried out, not at least with a view to efficient and cost-effective grid expansion.

Die OMV Gas & Power GmbH führt ihr Bedauern zur von ungarischer Seite abgesagten Open Season im Zuge des Schwarzmeerkorridors aus. Der Wunsch nach einer Koppelung der nunmehr stattfindenden Auktion zusätzlicher Kapazitäten am Entry Punkt Mosonmagyarovar mit der ROHU Kapazitätsvergabe wird geäußert. Nach Rücksprache mit den FNB Gas Connect Austria GmbH werden die betroffenen FNB und Regulierungsbehörden einen entsprechenden Vergabeprozess akkordieren. Als geplanter Zeitpunkt wurde Juli 2018 avisiert.

OMV Gas & Power GmbH regrets the open season of the Black Sea Corridor, which has been canceled by the Hungarian side. A coupling of the auction of additional capacities at the entry point Mosonmagyarovar with the ROHU capacity allocation has been desired. In consultation with FNB Gas Connect Austria GmbH, the affected FNB and regulatory authorities will implement an appropriate allocation process. The planned date July 2018 was announced.

9 Summary

The new capacity requirements submitted were included in the 2017 CNDP and the transmission system operators developed corresponding projects which are suitable to meet the demand for additional capacity. The projects were developed in accordance with the European planning tools and in coordination with domestic and foreign transmission system operators. The demand of the distribution area was taken into consideration as well.

The TSOs provided information on the infrastructure required to be established in the next ten years to meet the submitted capacity requirements (Table 7). The projects which will be continued without modifications based on earlier approvals were listed in the CNDP (Table 12). The projects which will be continued with modifications based on earlier approvals were listed in the CNDP (Table 13).
The projects approved in previous CNDP, but no longer required on the basis of the current capacity scenario and therefore withdrawn by the transmission system operators, are listed in Table 6. The new projects which will be submitted in CNDP 2017 are listed in Table 14. For each project, an implementation schedule was prepared and the expected date of completion or the expected implementation period was specified in the project sheet (Annex 1).

The 2017 CNDP meets the aims set out in section 63 (4): The security of supply for consumers can be guaranteed by the already existing network. In planning new projects, great importance was placed on the high level of availability of pipeline capacity. Covering transport needs was ensured and the obligation to meet the infrastructure standard according to Article 5 Regulation (EU) No. 2017/1938 was fully complied with.

GCA submitted two new projects, TAG submitted one new project for new capacities.
A total of 18 new replacement investment projects have been submitted. Implementation of the projects will ensure security of supply for domestic and foreign customers.

In its decision of 23 June 2016 by E-Control Austria on the coordinated network development plan 2016, E-Control Austria has issued obligations.

- Gas Connect Austria GmbH and TAG Trans Austria Gasleitung GmbH have complied, like described in chapter 6.4.1, with the obligation 2b with the transmission of the corresponding data.
- AGGM, together with Gas Connect Austria GmbH and TAG Trans Austria Gasleitung GmbH, prepared an analysis of the effects of the ratio of electro driven compressor power to gas driven compressor power on the supply security of the Austrian market and is presented in chapter 3.6. The obligation 2c is therefore fulfilled.

10 Disclaimer

The 2017 Coordinated Network Development Plan exists in both German and English version; any conflicts between them are unintentional. The binding language version shall be the German one. The English translation shall not be binding and is provided solely for information purposes. The market area manager and the transmission system operator accept no liability for any variations in content or errors of translation.

List of abbreviations

AGGM	AGGM Austrian Gas Grid Management AG
AT	Austria
AZ	exit point
bar(a)	absolute bars
CAM	capacity allocation mechanism
CBCA	cross-border cost allocation
DE	Germany
DZK	dynamically allocable capacity
ECA	Energie-Control Austria
ENTSOG	European Network of Transmission System Operators Gas
TSO	transmission system operator
FZK	freely allocable capacity
GCA	Gas Connect Austria GmbH
GCV	gross calorific value
GSNE-VO 2013	Gas-Systemnutzungsentgelte-Verordnung (Gas System Charges Ordinance) 2013
GWG	Gaswirtschaftsgesetz (Natural Gas Act)
GWh	gigawatt hours
GRIP	Gas Regional Investment Plan
IP	interconnection point
CNDP	coordinated network development plan
kWh	kilowatt hours
LFP	long-term planning
MAB	March Baumgarten Gasleitung (March Baumgarten pipeline)
MAM	market area manager
MW	megawatt
MWh	megawatt hours
NCG	Net Connect Germany
NDP	network development plan
Nm^3/h	normal cubic metres per hour (0°C temperature)
PCI	project of common interest
PSA	pressure service agreement
SEL	Süddeutsche Erdgasleitung (South German natural gas line)
SK	Slovakia
SOL	Süd Ost Leitung (South East pipeline)
SoS	security of supply
TAG	Trans Austria Gasleitung
TYNDP	Ten Year Network Development Plan
UK	interruptible capacity
ÜACK	Überackern
DAM	distribution area manager
VTP	virtual trading point
CS	compressor station
ÜMS	metering station

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Annex 1

Projects of the 2017 CNDP

Projekt-sponsor	Poject-number	Project-typ*)	Projectname	Implementation time frame [years]	Planned completition [date]	Development compares with KNEP 2016 **)
GCA	2015/01a	IC	Bidirectional Austria Czech Interconnector	4.5		modification
GCA	2015/01b	IC	Projekt 1b: BACI DN 1200	4.25		continuation
GCA	2015/02a	IC	Entry Überackern	4.5		modification
GCA	2015/03	IC	Entry/Exit Überackern - Maximum	6		continuation
GCA	2015/04	IC	Entry Mosonmagyaróvár - Minimum	1.5		modification
GCA	2015/05	IC	Entry Mosonmagyarovar	4.5		modification
GCA	2015/06	IC	Mosonmagyaróvár plus			witdrawn
GCA	2015/07b	IC	Additional Demand in Distribution Area +		Q1 2018	modification
GCA	2015/08	IC	Entry/Exit Murfeld	4.5		modification
GCA	2015/10	IC	Entry Arnoldstein		Q3/2018	modification
GCA	2016/01	IC	Baumgarten Brezlav Interconnector			witdrawn
GCA	2016/02	IC	Oberkappel N4G Interkonnektor			witdrawn
GCA	2016/03	IC	Entry/Exit Murfeld & Entry Arnoldstein			witdrawn
GCA	2016/E1	R	110 kV Overhead Power Line		Q4 2021	modification
GCA	2016/E2	R	MS3 Reverse Flow		Q2 2019	continuation
GCA	2016/E4	R	Baumgarten MS3 & Oberkappel – Switch from orifice to ultrasound metering		Q4 2019	continuation
GCA	2016/E5	R	Revamp Oberkappel		Q1 2020	modification
GCA	2017/01	IC	Entry Mosonmagyaróvár Plus	4.5		new
GCA	2017/02	IC	Penta West – Distribution Area	1.5		new
GCA	2017/E4	R	Extension of Baumgarten Substation TAG NOxER II		Q3 2018	new
GCA	2017/E5	R	Replacement of Process Control System at the Rainbach Compressor Station		Q4 2019	new
GCA	2017/E6	R	SOL Revamp		Q4 2018	new
TAG	2015/R04	R	NOxER II		Q4/2018	modification
TAG	2016/01	IC	TAG Reverse Flow Weitendorf/Eggendorf		Q4/2019	modification
TAG	2016/02	IC	AZ1 additional entry and connection with BOP13		Q3 2018	continuation
TAG	2016/03	IC	Reverse Flow Baumgarten MT Station (MS2)	3.5		modification
TAG	2016/04	IC	TAG Baumgarten interconnection capacity (Mosonmagyaróvár)		Q4/2021	continuation
TAG	2016/05	IC	TAG Baumgarten interconnection capacity (BACI)	4.5		modification
TAG	2016/06	IC	TAG Baumgarten interconnection capacity (BBI)			witdrawn
TAG	2016/R07	R	DLE 1.5 + 72 holes PT module RC500 in CS Ruden		Q4 2017	continuation
TAG	2016/R08	R	Major Overall Renewal of Gate Valve Stations Orth/Kaindorf/Finkenstein		Q4/2017	modification
TAG	2016/R09	R	Exchange Leaking Valves St.Paul/ Rude/ Ludmannsdorf/ Arnoldstein		Q4/2019	modification
TAG	2016/R10	R	Renewal Low-Voltage Main Switchgear Grafendorf		Q4/2017	modification
TAG	2016/R11	R	Replacement of Gas-Hydraulic Actuators CS Baumgarten		Q4/2021	modification
TAG	2016/R12	R	Exchange of Station Control System (SCS), CS Ruden-Grafendorf-Baumgarten		Q4/2021	modification
TAG	2017/01	IC	TAG Baumgarten interconnection capacity (Mosonmagyaróvár) II	4.5		new
TAG	2017/R01	R	MS2 Refurbishment		Q4/2019	new
TAG	2017/R02	R	Major Overhaul Renewal of Valve Stations, Lichtenegg / Wielfresen 1 / Ettendorf / Ludmannsdorf		Q4/2019	new
TAG	2017/R03	R	Major Overhaul Renewal of Valve Stations Lanzenkirchen/ Sulmeck/ St.Paul/ Ruden/ Arnoldstein		Q4/2019	new
TAG	2017/R04	R	CS Baumgarten Grafendorf Ruden Substitution Gas Hydraulic Actuators TUCO		Q4/2019	new
TAG	2017/R05	R	Baumgarten Filter Separators & metering station MS2 Electrical Actuators		Q4/2019	new
TAG	2017/R06	R	DLE 1.5 + 72 hole PT module RC400 in CS-Ruden		Q4 2018	new
TAG	2017/R07	R	Gas Generator BC800 in CS-Baumgarten		Q1 2019	new
TAG	2017/R08	R	Gas Generator RC600 in CS-Ruden		Q4 2019	new
TAG	2017/R10	R	Sec.3: Replacement of TAG I damaged Insulation		Q4 2017	new
TAG	2017/R11	R	Sec.1: Refurbishment Sec Ball Valve SS1 (Orth)		Q3/2017	new
TAG	2017/R12	R	CS-E: Repl. Insulation Joint Loop2		Q3/2017	new
*)	IC		Project for incremental capacities			
	R		replacement investment project			
**)	continuation		Continuation of approved project without modification			
	modification		Continuation of approved project with modification			
	withdrawn		withdrawn project			
	new		new project			

<table>
<tr><th colspan="4">GCA 2015/01a: Bidirectional Austria Czech Interconnector</th></tr>
<tr><td>Project sponsor:</td><td>Gas Connect Austria GmbH</td><td>Implementation time frame:</td><td>4.5 years</td></tr>
<tr><td colspan="4">Project objective: The project aims to create technical bidirectional capacities on a freely allocable basis for the first time and to set up the Reintal entry and exit point between the Austrian market area and the Czech market.</td></tr>
<tr><td colspan="4">Project description:
The following investments are necessary for the project:
– New metering station at the handover station – Baumgarten (3x)
– New Baumgarten CS
– Transmission system connection between Baumgarten and Reintal
– New metering station at the handover station - Reintal</td></tr>
<tr><td colspan="2">Technical data: After completion of the project, the following additional freely allocable entry/exit capacities at the Reintal IP are planned to be available to the system users:
Reintal entry point 750,000 Nm³/h (0°C)
Reintal exit point 750,000 Nm³/h (0°C)</td><td colspan="2"> 
</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis 2017: € XX million. The cost estimate may deviate by +/- 25% due to uncertainties in the first planning phase.</td></tr>
<tr><td colspan="4">Project rationale: This project is necessary to foster the north-south corridor, reduce market isolation, increase the security of supply in the Czech Republic and in Austria and provide transport routes for alternative gas sources.</td></tr>
<tr><td colspan="4">Project phase: Identify and assess</td></tr>
<tr><td colspan="4">TYNDP: TRA-N-021</td></tr>
<tr><td>Changes:
GCA 2015/01a Version 2016: planned completion</td><td colspan="2">PCI status: yes, 6.4</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project status: The project was approved 2016 as a planning project and will be submitted for approval as a project with the specified modifications.</td></tr>
</table>

GCA 2015/01a: Bidirectional Austria Czech Interconnector	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Risk generally prevalent, but is continuously analysed and dealt with • **Burglary at construction site** Low risk, plot will be fenced in • **Traffic** No risk at present • **Emissions** No risk at present, electric compressor will be installed • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk, greenfield projects, only to be connected to existing facilities • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Medium risk, interconnection agreements • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Medium risk, only study information available currently	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** Medium risk, pipeline and station near nature protection area • **Plot (crossings, war relics, national heritage office, etc.)** High risk, easements time-critical for pipeline projects • **Acts of God** Low risk, delays due to weather • **Other projects** Low risk, coordination with other conversions	

<table>
<tr><th colspan="4">GCA 2015/01b: BACI DN 1200</th></tr>
<tr><td>Project sponsor:</td><td>Gas Connect Austria GmbH</td><td>Implementation time frame:</td><td>4.25 years</td></tr>
<tr><td colspan="4">Project objective: The project aims to create technical bidirectional capacities on a freely allocable basis for the first time and to set up the Reintal entry and exit point between the Austrian market area and the Czech market.</td></tr>
<tr><td colspan="2">Project description:
The following investments are necessary for Project 1b:
– New metering station at the handover station – Baumgarten
– New Baumgarten CS
– Transmission system connection between Baumgarten and Reintal
New metering station at the handover station - Reintal</td><td colspan="2"> 
</td></tr>
<tr><td colspan="4">Technical data: After completion of the project, the following additional freely allocable entry/exit capacities at the Reintal IP are planned to be available to the system users:
Reintal entry point 1,480,000 Nm³/h (0°C)
Reintal exit point 1,480,000 Nm³/h (0°C)</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis 2015: € XX million. The cost estimate may deviate by +/- 25% due to uncertainties in the first planning phase.</td></tr>
<tr><td colspan="4">Project rationale:
This project is necessary to foster the north-south corridor, reduce market isolation, increase the security of supply in the Czech Republic and in Austria and provide transport routes for alternative gas sources.</td></tr>
<tr><td colspan="4">Project phase: Identify and assess</td></tr>
<tr><td>TYNDP:-</td><td colspan="2">PCI status:-</td><td>CBCA decision: -</td></tr>
<tr><td colspan="4">Project status: The project was approved as a planning project in the official decision approving the 2015 CNDP (V KNEP G 01/15) on 27 October 2015.</td></tr>
</table>

GCA 2015/02a: Entry Überackern			
Project sponsor:	Gas Connect Austria GmbH	**Implementation time frame:**	4.5 years

Project objective: The project aims to increase technical capacity at the Überackern SUDAL entry point to cover projected demand for additional entry capacities at the Überackern SUDAL point. As the Überackern SUDAL, Überackern ABG and Oberkappel points are in competition, capacity at the Oberkappel entry point will also be adjusted.

Project description:

The following investments are necessary for the project:

- Modification of the Überackern metering station at the handover station
- Überackern CS "New"
- WAG partial loop
- Modification of Oberkappel metering station
- Modification Baumgarten station

Technical data: Project-related analyses were carried out on the basis of the following additional capacities: technically marketable capacity, Überackern SUDAL entry point: 674,500 Nm³/h (0°C)

technically marketable capacity, Oberkappel entry point: 1,175,000 Nm³/h (0°C)

Economic data: After completion of the project, the following additional freely available entry capacity to the transmission system will be available to system users at the Überackern entry point:

Überackern SUDAL entry point: + 223,414 Nm³/h (0°C)

Oberkappel entry point: + 223,414 Nm³/h (0°C)

Investment cost basis 2017 inkl. 25% contingency: € 204.994.875. The cost estimate may deviate by +/- 25% due to uncertainties in the first planning phase. The extension threshold for implementing the project is reached as soon as the costs allocated to the Überackern IP are covered by binding long-term bookings.

Project rationale: In particular, this project becomes necessary to be able to cover the projected additional capacity demand at the Überackern SUDAL entry point.

Project phase: Identify and assess

TYNDP: -	**PCI status:** Not available	**CBCA decision:** no

Changes: GCA 2015/02a Version 2016: planned completion

Project status: The project was approved 2016 as a project and will be submitted for approval as a project with the specified modifications.

GCA 2015/02a: Entry Überackern	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Risk generally prevalent, but is continuously analysed and dealt with • **Burglary at construction site** Low risk, plot will be fenced in • **Traffic** No risk at present • **Emissions** No risk at present, electric compressor will be installed • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk, greenfield projects, only minor changes to existing facilities • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk, interconnection agreements • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Medium risk, only study information available currently	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** Medium risk, pipeline and station required • **Plot (crossings, war relics, national heritage office, etc.)** High risk, easements time-critical for pipeline projects • **Acts of God** Low risk, delays due to weather • **Other projects** Low risk, coordination with other conversions	

GCA 2015/03: Entry/Exit Überackern – Maximum			
Project sponsor:	Gas Connect Austria GmbH	**Implementation time frame:**	6 years

Project objective: The project aims at increasing technical capacity at the Überackern entry/exit point to present a possible maximum variant and analyse alternative routes for potential storage connections.

Project description:

The following investments are necessary for the project:

- New Überackern CS
- Modification of the Überackern metering station at the handover station: Switch of the connection points of the border crossing pipelines of the SUDAL and ABG rails and installation of an additional filter separator on the future ABG rail.
- Penta West pipeline loop
- Modification of the Neustift metering and compressor stations
- WAG loop
- Modification of the Rainbach and Kirchberg compressor stations
- Piping at Baumgarten

Technical data: After completion of the project, the following additional freely allocable entry/exit capacities at the Überackern IP are planned to be available to the system users:

Überackern SUDAL/ABG/7 Fields entry point 1,427,389 Nm³/h (0°C)

Überackern SUDAL/ABG/7 Fields exit point 1,580,440 Nm³/h (0°C)

Economic data: Investment cost basis 2015: € XX million. The cost estimate may deviate by +/- 25% due to uncertainties in the first planning phase. The extension threshold for implementing the project is reached as soon as the costs allocated to the Überackern IP are covered by binding long-term bookings or binding long-term bookings by the storage system operator.

Project rationale: This project is being examined in order to present a possible maximum variant and to examine alternative routes for potential storage connections. It also increases security of supply in Austria and in Europe.

Project phase: Identify and assess

TYNDP:-	**PCI status:-**	**CBCA decision: -**

Project status: The project was approved as a planning project in the official decision approving the 2015 CNDP (V KNEP G 01/15) on 27 October 2015.

<table>
<tr><th colspan="4">GCA 2015/04: Entry Mosonmagyaróvár - Minimum</th></tr>
<tr><td>Project sponsor:</td><td>Gas Connect Austria GmbH</td><td>Implementation time frame:</td><td>1.5 years</td></tr>
<tr><td colspan="4">Project objective: The project aims to create technical capacity at the Mosonmagyaróvár entry point to cover projected demand for additional entry capacities at the Mosonmagyaróvár point on a freely allocable basis.</td></tr>
<tr><td colspan="3">Project description:
The following investments are necessary for the project:
– Modification HAG MS: Filter separator, metering routes, regulation, piping
– Extension of the Baumgarten node</td><td> 
</td></tr>
<tr><td colspan="4">Technical data: Project-related analyses were carried out on the basis of the following additional capacities:
Mosonmagyaróvár entry point 120,000 Nm³/h (0°C)</td></tr>
<tr><td colspan="4">Economic data: After completion of the project, the following additional freely allocable entry/exit capacities at the Mosonmagyaróvár IP are planned to be available to the system users in accordance with the demand submitted:
Mosonmagyaróvár entry point 114,155 Nm³/h (0°C)
Investment cost basis 2015: € XX million. The cost estimate may deviate by +/- 25% due to uncertainties in the first planning phase. The realization of the project depends on a pressure support by the upstream TSO at the entry point to realize the above mentioned FZK capacities.</td></tr>
<tr><td colspan="4">Project rationale: This project is being examined in order to cover the additional demand for capacity submitted at the Mosonmagyaróvár entry point. It also increases security of supply in Austria and in Europe and diversifies sources of natural gas and supply routes.</td></tr>
<tr><td colspan="4">Project phase: Identify and assess</td></tr>
<tr><td>TYNDP:-</td><td colspan="2">PCI status:-</td><td>CBCA decision: -</td></tr>
<tr><td colspan="4">Project status: The project was approved as a planning project in the official decision approving the 2015 CNDP (V KNEP G 01/15) on 27 October 2015 and will be continued as a project.</td></tr>
</table>

<table>
<tr><th colspan="4">GCA2015/05: Entry Mosonmagyaróvár</th></tr>
<tr><td>Project sponsor:</td><td>Gas Connect Austria GmbH</td><td>Implementation time frame:</td><td>4.5 years</td></tr>
<tr><td colspan="4">Project objective: The project aims to create technical capacity at the Mosonmagyaróvár entry point to cover projected demand for additional entry capacities at the Mosonmagyaróvár point on a freely allocable basis.</td></tr>
<tr><td colspan="4">Project description:
The following investments are necessary for the project:
– Modification HAG MS: Filter separator, metering routes, regulation, piping
– New HAG CS
Extension of the Baumgarten node</td></tr>
<tr><td colspan="2">Technical data: Project-related analyses were carried out on the basis of the following additional capacities:
technically marketable capacity, Mosonmagyaróvár entry point: 570,000 Nm³/h (0°C)</td><td colspan="2"> 
</td></tr>
<tr><td colspan="4">Economic data: After completion of the project, the following additional freely allocable entry/exit capacities at the Mosonmagyaróvár IP are planned to be available to the system users in accordance with the demand submitted:
Mosonmagyaróvár entry point + 570,000 Nm³/h (0°C)
Investment cost basis 2017 inkl. 25% contingency: € 94.117.500. The cost estimate may deviate by +/- 25% due to uncertainties in the first planning phase. The extension threshold for implementing the project is reached as soon as the costs allocated to the Mosonmagyaróvár IP are covered by binding long-term bookings.</td></tr>
<tr><td colspan="4">Project rationale: This project aims at covering the projected additional demand for capacity at the Mosonmagyaróvár entry point.</td></tr>
<tr><td colspan="4">Project phase: Identify and assess</td></tr>
<tr><td>TYNDP: TRA-N-423</td><td colspan="2">PCI status: Yes, 6.24.3</td><td>CBCA decision: -</td></tr>
<tr><td colspan="4">Changes: GCA 2015/05 Version 2016: planned completion</td></tr>
<tr><td colspan="4">Project status: The project was approved 2016 and will be submitted for approval as a project with the specified modifications.</td></tr>
</table>

GCA2015/05: Entry Mosonmagyaróvár	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Risk generally prevalent, but is continuously analysed and dealt with • **Burglary at construction site** Low risk, plot will be fenced in • **Traffic** No risk at present • **Emissions** No risk at present, electric compressor will be installed • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk, greenfield projects, only to be connected to existing facilities • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk, interconnection agreement extension • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Medium risk, only study information available currently	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** Medium risk, station near nature protection area • **Plot (crossings, war relics, national heritage office, etc.)** Low risk, no pipeline required or land already available • **Acts of God** Low risk, delays due to weather • **Other projects** Low risk, coordination with other conversions	

<table>
<tr><th colspan="4">GCA 2015/06: Mosonmagyaróvár plus</th></tr>
<tr><td>Project sponsor:</td><td>Gas Connect Austria GmbH</td><td>Implementation time frame:</td><td>4 years</td></tr>
<tr><td colspan="4">Project objective: The project aims to create technical capacity at the Mosonmagyaróvár entry point to cover projected demand for additional entry capacities at the Mosonmagyaróvár point on a freely allocable basis.</td></tr>
<tr><td colspan="3">Project description:
The following investments are necessary for the project:
– Loop of the HAG pipeline
– New HAG CS
– Extension of the Baumgarten node including construction of new metering routes</td><td> 
</td></tr>
<tr><td colspan="4">Technical data: After completion of the project, the following additional freely allocable entry/exit capacities at the Mosonmagyaróvár IP are planned to be available to the system users:
Mosonmagyaróvár entry point 2,300,000 Nm³/h (0°C)</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis 2015: € XX million. The cost estimate may deviate by +/- 25% due to uncertainties in the first planning phase. The extension threshold for implementing the project is reached as soon as the costs allocated to the Mosonmagyaróvár IP are covered by binding long-term bookings.</td></tr>
<tr><td colspan="4">Project rationale: This project is being examined in order to cover the projected additional demand for capacity at the Mosonmagyaróvár entry point. It also increases security of supply in Austria and in Europe and diversifies sources of natural gas and supply routes.</td></tr>
<tr><td colspan="4">Project phase: Identify and assess</td></tr>
<tr><td>TYNDP: TRA-N-583</td><td colspan="2">PCI status:-</td><td>CBCA decision: -</td></tr>
<tr><td colspan="4">Project status: The project will be withdrawn.</td></tr>
</table>

<table>
<tr><th colspan="4">GCA 2015/07b: Additional Demand in Distribution Area +</th></tr>
<tr><td>Project sponsor:</td><td>Gas Connect Austria GmbH</td><td>Planned completion:</td><td>Q1/2018</td></tr>
<tr><td colspan="4">Project objective: The project aims to increase technical capacity at the virtual point from the distribution area to the GCA transmission system level to cover the submitted demand for additional entry capacities at the virtual point on a freely allocable basis.</td></tr>
<tr><td colspan="4">Project description:
The following investments are necessary for the project:
– Extension of the WAG suction pipe in order to divert the entire quantity (600,000 PVS + 515,000 MAB) in a compressed manner to the WAG system.
– Reconnect HAG metering station and establish direct connection of collector via BOP11 in the WAG.
– Construction of TAG AZ</td></tr>
<tr><td colspan="4">Technical data: After completion of the project, the following additional freely available entry capacity at the virtual point from the distribution area to the GCA transmission system level are planned to be available to system users:
Virtual entry point 960,000 Nm³/h
The assumptions for this project are based on input pressure at Baumgarten of 54 barg.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis 2017: € XX million. The cost estimate may deviate by +/- 10% due to uncertainties in the implementation phase.</td></tr>
<tr><td colspan="4">Project rationale: In particular, this project is reviewed to cover the projected additional capacity demand at the virtual point from the distribution area to the GCA transmission system level.</td></tr>
<tr><td colspan="4">Project phase: Execute</td></tr>
<tr><td colspan="2">TYNDP: -</td><td colspan="2">PCI status: -</td><td>CBCA decision: -</td></tr>
<tr><td colspan="4">Changes: GCA 2015/07b Version 2016: planned completion, project description</td></tr>
<tr><td colspan="4">Project status: The project is being implemented.</td></tr>
</table>

GCA 2015/07b: Additional Demand in Distribution Area +	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Risk generally prevalent, but is continuously analysed and dealt with • **Burglary at construction site** Low risk, plot will be fenced in • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk, interconnection agreements • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Low risk, in implementation phase	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** Low risk, in implementation phase • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk, delays due to weather • **Other projects** Low risk, coordination with other conversions	

<table>
<tr><th colspan="4">GCA2015/08: Entry/Exit Murfeld</th></tr>
<tr><td>Project sponsor:</td><td>Gas Connect Austria GmbH</td><td>Implementation time frame:</td><td>4.5 years</td></tr>
<tr><td colspan="4">Project objective: The project aims to increase technical capacities on FZK basis at the Murfeld entry/exit point and to create technical capacities on FZK basis at the Murfeld entry point for the first time.</td></tr>
<tr><td colspan="2">Project description:
The following investments are necessary for the project:
– Extension of Weitendorf and Murfeld metering stations: Filter separator, metering routes, regulation, piping
– New Murfeld CS
– Loop of the SOL over entire length
– Loop of the Murfeld – Cersak border crossing pipeline</td><td colspan="2"> 
</td></tr>
<tr><td colspan="4">Technical data: Project-related analyses were carried out on the basis of the following additional capacities:
technical marketable capacity, Murfeld entry point 620,000 Nm³/h (0°C)
technically marketable capacity, Murfeld exit point 810,620 Nm³/h (0°C)</td></tr>
<tr><td colspan="4">Economic data: After completion of the project, the following new freely allocable entry/exit capacities at the Murfeld IP are planned to be available to the system users:
Murfeld entry point + 614,388 Nm³/h (0°C)
Murfeld exit point + 391,620 Nm³/h (0°C)
Investment cost basis 2017 inkl. 25% contingency: € 125.389.125. The cost estimate may deviate by +/- 25% due to uncertainties in the first planning phase. The extension threshold for implementing the project is reached as soon as the costs allocated to the virtual point are covered by binding long-term bookings.</td></tr>
<tr><td colspan="4">Project rationale: This project aims at covering the projected additional demand for capacity at the Mosonmagyaróvár entry and exit points.</td></tr>
<tr><td colspan="4">Project phase: Identify and assess</td></tr>
<tr><td>TYNDP: TRA-N-361</td><td colspan="2">PCI status: yes, 6.26.4</td><td>CBCA decision: -</td></tr>
<tr><td colspan="4">Changes: GCA 2015/08 Version 2016: planned completion, project description</td></tr>
<tr><td colspan="4">Project status: The project was approved 2015 and will be submitted for approval as a project with the specified modifications.</td></tr>
</table>

GCA2015/08: Entry/Exit Murfeld:	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Risk generally prevalent, but is continuously analysed and dealt with • **Burglary at construction site** Low risk, plot will be fenced in • **Traffic** No risk at present • **Emissions** Medium risk, gas compressor will be installed • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk, greenfield projects, only to be connected to existing facilities • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk, interconnection agreements • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Medium risk, only study information available currently	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** Medium risk, pipeline and station required • **Plot (crossings, war relics, national heritage office, etc.)** High risk, easements time-critical for pipeline projects • **Acts of God** Low risk, delays due to weather • **Other projects** Low risk, coordination with other conversions	

<table>
<tr><th colspan="4">GCA2015/10: Entry Arnoldstein</th></tr>
<tr><td>Project sponsor:</td><td>Gas Connect Austria GmbH</td><td>Planned completion:</td><td>Q3/2018</td></tr>
<tr><td colspan="4">Project objective: The project aims to facilitate the maximum possible freely allocable capacity at the Arnoldstein entry point.</td></tr>
<tr><td colspan="2">Project description:
The following investments are necessary:
– Increase in connection capacity at Baumgarten from the TAG line to the VTP and to other systems (TAG AZ, MS 4 bidirectional)</td><td colspan="2"> 
</td></tr>
<tr><td colspan="4">Technical data: For implementation of the project, freely allocable capacity yet to be realised at the Arnoldstein entry point of 11,190 MWh/h or 1,000,000 Nm³/h (0°C) (to be analysed) was agreed with TAG.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis 2017: € XX million. The cost estimate may deviate by +/- 10% due to uncertainties in the implementation phase.</td></tr>
<tr><td colspan="4">Project rationale: This project aims to enable the maximum possible freely allocable capacity at the Arnoldstein entry point and to comply with the condition imposed in the official decision approving the 2016-2025 CNDP.</td></tr>
<tr><td colspan="4">Project phase: Execute</td></tr>
<tr><td>TYNDP: -</td><td>PCI status: -</td><td colspan="2">CBCA decision: -</td></tr>
<tr><td colspan="4">Changes: 2015/10 Version 2016: Planned completion</td></tr>
<tr><td colspan="4">Project status: The project is currently being implemented,</td></tr>
</table>

GCA2015/10: Entry Arnoldstein	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Risk generally prevalent, but is continuously analysed and dealt with • **Burglary at construction site** Low risk, plot will be fenced in • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk, interconnection agreements • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Low risk, end of pre-phase	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** Low risk, end of pre-phase • **Plot (crossings, war relics, national heritage office, etc.)** Low risk, end of pre-phase • **Acts of God** Low risk, delays due to weather • **Other projects** Low risk, coordination with other conversions	

<table>
<tr><th colspan="4">GCA 2016/01: Baumgarten Brezlav Interconnector</th></tr>
<tr><td>Project sponsor:</td><td>Gas Connect Austria GmbH</td><td>Planned completion:</td><td>Q4/2021</td></tr>
<tr><td colspan="4">Project objective: The project aims to create technical bidirectional capacities on a freely allocable basis for the first time and to set up the Reintal entry and exit point between the Austrian market area and the Czech market.</td></tr>
<tr><td colspan="2">Project description:
The following investments are necessary for the project:
– New metering station at the handover station – Baumgarten (3x)
– New Baumgarten CS
– Transmission system connection between Baumgarten and Reintal
– New metering station at the handover station - Reintal</td><td colspan="2"> 
</td></tr>
<tr><td colspan="4">Technical data: After completion of the project, the following additional freely allocable entry/exit capacities at the Reintal IP are planned to be available to the system users:
Reintal entry point 4,900,000 Nm³/h (0°C)
Reintal exit point 750,000 Nm³/h (0°C)</td></tr>
<tr><td colspan="4">Economic data: After completion of the project, the following additional freely allocable entry/exit capacities at the Reintal IP are planned to be available to the system users:
Reintal entry point 4,745,833 Nm³/h (0°C)
Reintal exit point 750,000 Nm³/h (0°C)
Investment cost basis 2016: € XX million. The cost estimate may deviate by +/- 25% due to uncertainties in the first planning phase. The extension threshold for implementing the project is reached as soon as the costs allocated to the Reintal IP are covered by binding long-term bookings.</td></tr>
<tr><td colspan="4">Project rationale: In particular, this project is reviewed to cover the projected additional capacity demand at the Reintal entry/exit point.</td></tr>
<tr><td colspan="4">Project phase: Identify and assess</td></tr>
<tr><td colspan="2">TYNDP:-</td><td>PCI status:-</td><td>CBCA decision: -</td></tr>
<tr><td colspan="4">Project status: The project will be withdrawn.</td></tr>
</table>

<table>
<tr><th colspan="4">GCA 2016/02: Oberkappel N4G Interconnector</th></tr>
<tr><td>Project sponsor:</td><td>Gas Connect Austria GmbH</td><td>Planned completion:</td><td>Q1/2022</td></tr>
<tr><td colspan="4">Project objective: The project is directly linked to the project TAG 2016/04. The project aims to create technical bidirectional capacities on a freely allocable basis for the first time and to set up the Diendorf entry and exit point between the Austrian market area and the Czech market.</td></tr>
<tr><td colspan="2">Project description:
The following investments are necessary for the project:
– WAG partial loop
– Modifications Baumgarten station (BOP 13, TAG AZ)
– Alterations to MAB connection</td><td colspan="2"> 
</td></tr>
<tr><td colspan="4">Technical data: After completion of the project, the following additional freely allocable entry/exit capacities at the Diendorf IP are planned to be available to the system users:
Diendorf entry point 413,000 Nm³/h (0°C)
Diendorf exit point 413,000 Nm³/h (0°C)</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis 2016: € XX million. The cost estimate may deviate by +/- 25% due to uncertainties in the first planning phase. The extension threshold for implementing the project is reached as soon as the costs allocated to the Diendorf IP are covered by binding long-term bookings.</td></tr>
<tr><td colspan="4">Project rationale: This project is necessary to facilitate provision of FZK quality in GCA's transmission system of the additional capacities resulting from the project submitted by N4G.</td></tr>
<tr><td colspan="4">Project phase: Identify and assess</td></tr>
<tr><td>TYNDP:-</td><td colspan="2">PCI status:-</td><td>CBCA decision: -</td></tr>
<tr><td colspan="4">Project status: The project will be withdrawn.</td></tr>
</table>

<table>
<tr><th colspan="4">GCA2016/03: Entry/Exit Murfeld & Entry Arnoldstein</th></tr>
<tr><td>Project sponsor:</td><td>Gas Connect Austria GmbH</td><td>Planned completion:</td><td>Q4/2021</td></tr>
<tr><td colspan="4">Project objective: The project aims to increase technical capacities on FZK basis at the Murfeld exit point and, for the first time, to create technical FZK capacity at the Murfeld entry point and FZK capacity at the Arnoldstein entry point.</td></tr>
<tr><td colspan="2">Project description:
The following investments are necessary for the project:
– Extension of Weitendorf and Murfeld metering stations: Filter separator, metering routes, regulation, piping
– New Murfeld CS
– Loop of the SOL between Leibnitz and Murfeld
– Loop of the Murfeld – Cersak border crossing pipeline
– Modification Baumgarten (TAG AZ, MS 4, BOP 13)</td><td colspan="2"> 
</td></tr>
<tr><td colspan="4">Technical data: Project-related analyses were carried out on the basis of the following additional capacities:
technical marketable capacity, Murfeld entry point 620,000 Nm³/h (0°C)
technically marketable capacity, Murfeld exit point 810,620 Nm³/h (0°C)
For implementation of the project, freely allocable capacity yet to be analysed at the Arnoldstein entry point of 11,190 MWh/h or 1,000,000 Nm³/h (0°C) (to be analysed) was agreed with TAG.</td></tr>
<tr><td colspan="4">Economic data: After completion of the project, the following new freely allocable entry/exit capacities at the Murfeld IP are planned to be available to the system users:
Murfeld entry point 614,388 Nm³/h (0° C)
Murfeld exit point 391,620 Nm³/h (0° C)
Investment cost basis 2016: € XX million. The cost estimate may deviate by +/- 25% due to uncertainties in the first planning phase. The extension threshold for implementing the project is reached as soon as the costs allocated to the virtual point are covered by binding long-term bookings.</td></tr>
<tr><td colspan="4">Project rationale: This project is examined in order to cover the additional demand submitted for the Murfeld entry and exit point and to comply with the condition imposed in the official decision approving the 2016-2025 CNDP.</td></tr>
<tr><td colspan="4">Project phase: Identify and assess</td></tr>
<tr><td>TYNDP:-</td><td>PCI status:-</td><td colspan="2">CBCA decision: -</td></tr>
<tr><td colspan="4">Project status: The project will be withdrawn.</td></tr>
</table>

GCA 2016/E1: 110 kV Overhead Power Line			
Project sponsor:	Gas Connect Austria GmbH	**Planned completion:**	Q4/2021
Project objective: Increase security of supply			
Project description: − Construction of a substation in the Oberweiden area − Construction of a 110 kV overhead power line from Untersiebenbrunn to Oberweiden Looping of existing underground cables into the new Oberweiden substation by way of system admission to Netz Niederösterreich			
Technical data: No increase in marketable capacity			
Economic data: Investment cost basis 2017: € XX million. The cost estimate may deviate by +/- 25% due to uncertainties in the first planning phase.			
Project rationale: A significant improvement in security of supply to the compressor station, as power will be supplied from the public 110kV grid at two physically separate locations. Reduction in electrical losses from the underground cables due to the reduced length In future it will be possible to utilise the entire installed capacity at the Baumgarten substation including upstream cabling systems			
Project phase: Identify and assess			
TYNDP: -	**PCI status: -**	**CBCA decision: -**	
Project status: The project was approved in 2016 and will be continued with the specified modifications.			

GCA 2016/E1: 110 kV overhead power line	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Risk generally prevalent, but is continuously analysed and dealt with • **Burglary at construction site** Low risk, plot will be fenced in • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk, interconnection agreements • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Medium risk, only in pre-phase currently	
Project environment • **Legal framework, authorities, easements** Medium risk • **Stakeholders and political environment** Medium risk, overhead power line • **Plot (crossings, war relics, national heritage office, etc.)** Medium risk, construction of overhead power line by third party • **Acts of God** Low risk, delays due to weather • **Other projects** Low risk, coordination with other conversions	

<table>
<tr><th colspan="4">GCA 2016/E2: MS3 Reverse Flow</th></tr>
<tr><td>Project sponsor:</td><td>Gas Connect Austria GmbH</td><td>Planned completion:</td><td>Q2/2019</td></tr>
<tr><td colspan="4">Project objective: Operational correction of MS3 for reverse flow to SK</td></tr>
<tr><td colspan="4">Project description:
– Installation of control valves supporting bidirectional use
– Bypass of the MS3 filter to allow bidirectional use of MS3</td></tr>
<tr><td colspan="4">Technical data: Implementation of projects GCA 2015/07b, GCA 2015/10 and GCA 2016/E4 as specified in the 2016 CNDP will provide additional freely allocable exit capacities at the Baumgarten WAG entry/exit point.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis 2017: € XX million. The cost estimate may deviate by +/- 10% due to uncertainties in the implementation phase.</td></tr>
<tr><td colspan="4">Project rationale: MS3 currently serves as an import metering route for gas from the Slovak Republic arriving at Baumgarten via pipelines G00-118, G00-029 and WAG SK. Volume control where required is managed by the WAG compressors.
To achieve reverse flow in the WAG (from the WAG to the Slovak Republic), the station inlet and outlet has to be cross-connected in a special operating mode.
In this way the flow direction through MS3 during reverse flow remains the same as in normal flow.
The cross-connection fittings must, however, be lead-sealed in the presence of the two contractual partners to ensure that MS3 is not circumvented. While organisation of this activity requires additional effort, switching the equipment takes between several hours and an entire day. What is more, in this operating mode the fuel gas required for the station is taken from the line downstream from measurement This is not permitted at that point.
The reverse flow option in the WAG is to be corrected, while meeting these criteria:
• The need to lead-seal fittings is to be avoided and automatic switching between normal and reverse flow enabled
• Fuel gas must always be taken from the line within the GCA system
• Linepack must be clearly defined during fully bidirectional capacity of the measuring routes
• Option of controlling gas volume in normal and reverse flow mode
• Potential compression in reverse flow at Baumgarten (only as a future option not yet implemented)</td></tr>
<tr><td colspan="4">Project phase: Execute</td></tr>
<tr><td colspan="2">TYNDP: -</td><td colspan="2">PCI status:-</td><td>CBCA decision:-</td></tr>
<tr><td colspan="4">Project status: The project was approved in 2016 and is being implemented.</td></tr>
</table>

GCA 2016/E2: MS3 Reverse Flow	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Risk generally prevalent, but is continuously analysed and dealt with • **Burglary at construction site** Low risk, plot will be fenced in • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Medium risk, interconnection agreements • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Medium risk, in pre-phase currently	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** Low risk • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk, delays due to weather • **Other projects** Low risk, coordination with other conversions	

GCA 2016/E4: Baumgarten MS3 & Oberkappel – Switch from orifice to ultrasound metering			
Project sponsor:	Gas Connect Austria GmbH	**Planned completion:**	Q4/2019
Project objective: Switch from orifice to ultrasound metering at metering station MS3 at Baumgarten and Oberkappel metering station.			
Project description: Metering station MS3 at Baumgarten filters and meters imported gas from G00-118 and the WAG from Vysoka/SK. The Oberkappel metering station filters, meters and regulates gas from the WAG in the direction of Wildenranna/DE and in the reverse flow direction. The metering technique currently used (orifice metering) is no longer considered state of the art and the station is being converted to use ultrasound meters. In order to avoid capacity restrictions the two stations are converted separately			
Technical data: This project will not create any freely allocable entry or exit capacities.			
Economic data: Investment cost basis 2017: € XX million. The cost estimate may deviate by +/- 25% due to uncertainties in the first planning phase.			
Project rationale: This project is required because the metering technique currently used at both metering stations is no longer considered state of the art.			
Project phase: Define			
TYNDP: -	**PCI status: -**	**CBCA decision: -**	
Project status: The project was approved in 2016 and is being implemented.			

GCA 2016/E4: Baumgarten MS3 & Oberkappel – Switch from orifice to ultrasound metering	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Risk generally prevalent, but is continuously analysed and dealt with • **Burglary at construction site** Low risk, plot will be fenced in • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Medium risk, interconnection agreements • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Medium risk, in pre-phase currently	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** Low risk • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk, delays due to weather • **Other projects** Low risk, coordination with other conversions	

GCA 2016/E5: Revamp Oberkappel			
Project sponsor:	Gas Connect Austria GmbH	**Planned completion:**	Q1/2020
Project objective: To enable controlled, metered and filtered transport of the capacity of 1,400,000 Nm³/h based on the N-1 operating principle.			
Project description: The existing metering station at Oberkappel (ÜMS OK) serves to reliably transport and meter gas between the WAG1 (Austria) and WAG800 (Germany) pipeline systems. – Capacities for Oberkappel at 49 barg excess pressure: o Entry OKP: max. 1,400,000 Nm³/h o Exit OKP: max. 1,400,000 Nm³/h o Minimum volume: 15,000 Nm³/h – Design pressure for control 49 bar to design pressure, for the entire volume range. – In refitting the control system, only the marketed capacities are to be considered; potential future capacities are not taken into account. – Design data o Design pressure PN 77 o New filter separator FS5 PN90 o New control valves PN90 o 32" header (inlet and outlet) # 1,400,000 m³/h at approx. 15 m/s – Refitting work relates to the entire high pressure gas system including secondary systems such as the process control system, gas analysis, LKS, fire and gas detection systems, and the blow-off system.			
Technical data: This project maximises flexibility at Oberkappel.			
Economic data: Investment cost basis 2017: € XX million. The cost estimate may deviate by +/- 25% due to uncertainties in the first planning phase.			
Project rationale: This project is required because the technical gas equipment currently used is no longer considered state of the art and does not comply with safety requirements.			
Project phase: Define			
TYNDP: -	**PCI status: -**	**CBCA decision: -**	
Project status: The project was approved in 2016 and will be continued with the specified modifications.			

GCA 2016/E5: Revamp Oberkappel	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Risk generally prevalent, but is continuously analysed and dealt with • **Burglary at construction site** Low risk, plot will be fenced in • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Medium risk, significant modification of existing state • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk, interconnection agreements • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Medium risk, in pre-phase currently	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** Low risk • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk, delays due to weather • **Other projects** Low risk, coordination with other conversions	

<table>
<tr><th colspan="4">GCA 2017/01: Entry Mosonmagyaróvár Plus</th></tr>
<tr><td>Project sponsor:</td><td>Gas Connect Austria GmbH</td><td>Implementation time frame:</td><td>4.5 years</td></tr>
<tr><td colspan="4">Project objective: The project aims to create technical capacity at the Mosonmagyaróvár entry point to cover projected demand for additional entry capacities at the Mosonmagyaróvár point on a freely allocable basis.</td></tr>
<tr><td colspan="2">Project description:
The following investments are necessary for the project:
– Loop of the HAG pipeline
– New HAG CS
– Extension of the Baumgarten node including construction of new metering routes</td><td colspan="2"> 
</td></tr>
<tr><td colspan="4">Technical data: After completion of the project, the following additional freely allocable entry/exit capacities at the Mosonmagyaróvár IP are planned to be available to the system users:
Mosonmagyaróvár entry point 1,000,000 Nm³/h (0°C)</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis 2017 inkl. 25% contingency: € 202.000.000. The cost estimate may deviate by +/- 25% due to uncertainties in the first planning phase. The extension threshold for implementing the project is reached as soon as the costs allocated to the Mosonmagyaróvár IP are covered by binding long-term bookings.</td></tr>
<tr><td colspan="4">Project rationale: This project is being examined in order to cover the projected additional demand for capacity at the Mosonmagyaróvár entry point. It also increases security of supply in Austria and in Europe and diversifies sources of natural gas and supply routes.</td></tr>
<tr><td colspan="4">Project phase: Identify and assess</td></tr>
<tr><td>TYNDP: TRA-N-583</td><td colspan="2">PCI status: -</td><td>CBCA decision:-</td></tr>
<tr><td colspan="4">Project status: The project is submitted for approval as a project under the conditions stated in the economic data section.</td></tr>
</table>

GCA 2017/01: Entry Mosonmagyaróvár Plus	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Risk generally prevalent, but is continuously analysed and dealt with • **Burglary at construction site** Low risk, plot will be fenced in • **Traffic** No risk at present • **Emissions** No risk at present, electric compressor will be installed • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk, greenfield projects, only to be connected to existing facilities • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk, interconnection agreement extension • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Medium risk, only study information available currently	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** Medium risk, pipeline and station near nature protection area • **Plot (crossings, war relics, national heritage office, etc.)** High risk, easements time-critical for pipeline projects • **Acts of God** Low risk, delays due to weather • **Other projects** Low risk, coordination with other conversions	

<table>
<tr><td colspan="4">GCA 2017/02: Penta West – Distribution Area</td></tr>
<tr><td>Project sponsor:</td><td>Gas Connect Austria GmbH</td><td>Implementation time frame:</td><td>1.5 years</td></tr>
<tr><td colspan="4">Project objective:
The aim of the project is to provide technical capacity along the Pent West pipeline at the station Andorf for an exit into the distribution area.</td></tr>
<tr><td colspan="2">Project description:
The following investments are necessary for the project:
- Adaptation and expansion of the station Andorf on the Pent West</td><td colspan="2"> 
</td></tr>
<tr><td colspan="4">Technical data:
The following additional FZK capacity at the point Andorf on the Penta West exit transmission network are to be available to network users from the completion of the project: 5,000 Nm³ / h (0 ° C)</td></tr>
<tr><td colspan="4">Economic data:
Investment cost base 2017: € million XX. The cost estimation has an accuracy of +/- 25%, which represents the uncertainty in the first planning phase. The realization of the project is achieved when the costs allocated to the point are covered by binding long-term bookings.</td></tr>
<tr><td colspan="4">Projektbegründung:</td></tr>
<tr><td colspan="4">Projektphase: Identify and Assess</td></tr>
<tr><td>TYNDP: -</td><td colspan="2">PCI Status: -</td><td>CBCA Entscheidung:-</td></tr>
<tr><td colspan="4">Projektstatus:
The project is submitted for approval as a planning project under the conditions stated in the economic data section.</td></tr>
</table>

GCA 2017/02: Penta West – Exit Verteilgebiet	Qualitative Risikobeurteilung
HSE Risiken • **Unfall mit Personen-, Sach-, Umweltschaden** Risiko grundsätzlich immer vorhanden, wird jedoch laufend analysiert und behandelt • **Einbruch auf der Baustelle** Geringes Risiko, Areal wird eingezäunt • **Verkehr** Derzeit kein Risiko • **Emissionen** Derzeit kein Risiko • **Reputation** Geringes Risiko, Anrainer	
Technische Risiken • **Surface / Subsurface** Derzeit kein Risiko • **Infrastruktur & Bestandsanlagen** Geringes Risiko, Anbindung an Bestand • **Qualität (Material, Bau/Inbetriebnahme, Gasqualität)** Derzeit kein Risiko • **Neue Technologien** Derzeit kein Risiko • **Betrieb (Bedienbarkeit, Wartbarkeit, Verfügbarkeit, etc.)** Derzeit kein Risiko	
Wirtschaftliche Risiken • **Lieferanten, Partner** Geringes Risiko • **Vertragsgestaltung** Geringes Risiko • **Märkte** Derzeit kein Risiko • **Versicherungen** Derzeit kein Risiko • **Wirtschaftlichkeit** Mittleres Risiko, derzeit nur als Studie vorhanden	
Projektumfeld • **Rechtliche Rahmenbedingungen, Behörden, Servitute** Derzeit kein Risiko • **Stakeholder & Politisches Umfeld** Derzeit kein Risiko • **Grundstück (Querungen, Kriegsrelikte, BDA, etc.)** Derzeit kein Risiko • **Naturereignisse** Geringes Risiko, Bauverzögerungen durch Witterungs-Bedingungen • **Andere Projekte** Geringes Risiko, Abstellungsplanung mit anderen Umbauten	

GCA 2017/E4: Extension of Baumgarten Substation TAG NOxER II			
Project sponsor:	Gas Connect Austria GmbH	**Planned completion:**	Q3/2018
Project objective: Extension of the BMG substation with the addition of a third transformer to ensure security of supply based on the N-1 principle.			
Project description: As a result of the NOxER II TAG project, about 18 MW of additional electrical power will be required at the BMG compressor station. The electricity will be supplied by the BMG substation, which will be able to supply this amount of power after expansion through the addition of a 110/20 kV transformer, including the required switching and supplementary systems. The BMG substation is jointly used infrastructure, supplying electricity to all power-consuming devices at the BMG compressor station.			
Technical data: This project will not create any freely allocable entry or exit capacities.			
Economic data: Investment cost basis 2017: € XX million. The cost estimate may deviate by +/- 10% due to uncertainties in the implementation phase.			
Project rationale: This project is specifically required due to the fact that increased energy demands cannot be met with existing equipment.			
Project phase: Execute			
TYNDP: -	**PCI status: -**	**CBCA decision: -**	
Project status: This replacement, optimization or security investment is submitted for approval.			

GCA 2017/E4: Extension of Baumgarten Substation TAG NOxER II	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Risk generally prevalent, but is continuously analysed and dealt with • **Burglary at construction site** Low risk, plot will be fenced in • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk, planning comp • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk • **Contracting** Low risk • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Low risk, planning comp	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** No risk at present • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk, delays due to weather • **Other projects** Low risk, coordination with other conversions	

GCA 2017/E5: Replacement of Process Control System at the Rainbach Compressor Station			
Project sponsor:	Gas Connect Austria GmbH	**Planned completion:**	Q4/2019
Project objective: Replacement of the process control system at the Rainbach compressor station.			
Project description: The existing process control system (PCS) at the station has reached the end of its service life. The system, a Siemens PCS7, was originally installed in 2004. The industry standard for the service life of a PCS is 10 years, while systems at GCA manage up to 15 years. System availability can no longer be guaranteed because some (hardware and software) components are no longer produced. Commercial availability of structurally identical replacement parts is limited. In some cases, later models require modification of the system, leading to increased cost and risk. This also means that it will in future be difficult or impossible to ensure that the system design complies with applicable standards. Replacement involves the entire PCS, which mainly includes all servers, clients, redundant and fail-safe CPUs, input and output level equipment, as well as network and remote control components. The marshalling cabinets will remain in place for the most part and only be modified. The user software will be adapted to the new configuration, with basic functions remaining the same. Systematic requirements will be implemented, as will be the new GCA standards introduced since the system was originally built.			
Technical data: This project will not create any freely allocable entry or exit capacities.			
Economic data: Investment cost basis 2016: € XX million. The cost estimate may deviate by +/- 25% due to uncertainties in the first planning phase.			
Project rationale: The project is specifically necessary because the existing process control system (PCS) at the station has reached the end of its service life and the availability of the compressor and metering station is no longer ensured.			
Project phase: Define			
TYNDP: -	**PCI status: -**	**CBCA decision: -**	
Project status: This replacement, optimization or security investment is submitted for approval.			

GCA 2017/E5: Replacement of Process Control System at the Rainbach Compressor Station	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Risk generally prevalent, but is continuously analysed and dealt with • **Burglary at construction site** Low risk • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** No risk at present	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Medium risk, significant modification of existing state • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk • **Contracting** Low risk • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Medium risk, only study information available currently	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** No risk at present • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk, delays due to weather • **Other projects** Low risk, coordination with other conversions	

<table>
<tr><th colspan="4">GCA 2017/E6: SOL Revamp</th></tr>
<tr><td>Project sponsor:</td><td>Gas Connect Austria GmbH</td><td>Planned completion:</td><td>Q4/2018</td></tr>
<tr><td colspan="4">Project objective: Renewal of the fittings and insulating joints on the SOL pipeline.</td></tr>
<tr><td colspan="4">Project description:
– Replacement of 19 knife-gate valves
– Replacement of leaky outlet bypass fittings at the Murfeld and Weitendorf metering stations
– Replacement of insulating joints (incl. recompression) at the inlet and outlet of the Murfeld metering station, the outlet of the Weitendorf metering station, and the inlet and outlet of the Leibnitz SS.
– Adaptation of the LKS at the Murfeld metering station, Weitendorf metering station and Leibnitz SS, and repair of two detected faulty points.</td></tr>
<tr><td colspan="4">Technical data: This project will not create any freely allocable entry or exit capacities.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis 2017: € XX million. The cost estimate may deviate by +/- 10% due to uncertainties in the implementation phase.</td></tr>
<tr><td colspan="4">Project rationale: In the course of pigging and fitting maintenance, leaks were identified in the knife-gate valves installed in the SOL about 40 years ago.
Faulty insulating joints need to be replaced.
Faults detected in the LKS during intensive metering in 2014 have to be repaired.</td></tr>
<tr><td colspan="4">Project phase: Execute</td></tr>
<tr><td colspan="2">TYNDP: -</td><td colspan="2">PCI status: -</td><td>CBCA decision: -</td></tr>
<tr><td colspan="4">Project status: This replacement, optimization or security investment is submitted for approval.</td></tr>
</table>

GCA 2017/E6: SOL Revamp	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Risk generally prevalent, but is continuously analysed and dealt with • **Burglary at construction site** Low risk, plot will be fenced in • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk, in implementation phase • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Low risk, planning comp	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** No risk at present • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk, delays due to weather • **Other projects** Low risk, coordination with other conversions	

TAG 2015/R04: NOxER II			
Project sponsor:	TAG GmbH	**Planned completion:**	Q4/2018
		As of:	20 November 2017

Project objective: Within the scope of the NOxER II project, equipment in the Baumgarten, Eggendorf, Grafendorf and Ruden compressor stations will be replaced as in accordance with official decisions under public law.

Please note in particular: TAG GmbH analyses the possibility of exchanging/removing the FR 3 gas turbines installed at the Baumgarten, Grafendorf and Ruden compressor stations of the TAG pipeline system by a new type of modern gas turbine engine compressors (TUCO) or by electrical compressors (integrally geared, ELCO). The required power (MW) to be installed replacing the existing FR 3 gas turbines will be specified in a hydraulic study of the TAG system.

Project description:

The following investments are necessary for implementing the project:

- Removal of 10 FR 3 machines at 3 sites
- Installation of 4 new ELCO machines at 3 sites
- Installation of 3 new e-supply cable systems

Technical data: The existing technical transport capacity will not change.

Economic data: Investment cost basis (2015 status): XXX€. The cost estimate may deviate by +/- 25%.

Investment cost basis (2017 status): XXX €

Project rationale: Pursuant to the new *Emissionsschutzgesetz für Kesselanlagen* (Pollution Control Act for Boiler Installations, EGK) and due to the age and the number of operating hours (approx. 100,000) of the installed Frame 3 gas turbines, TAG GmbH will gradually take the existing Frame 3 units off the grid in order to reduce NOx emissions polluting the TAG system.

Project phase:

Status when initially submitted: Implementation phase
2017 status: Implementation phase

TYNDP: no	**PCI status:** no	**CBCA decision:** no

Project modifications: The project was approved in the official decision approving the 2015 CNDP (V KNEP G 02/15) on 19 February 2016.

TAG 2015/R04 V1 – updates from previous version: economic data

Project status: The updates of the project are submitted for approval under the terms specified in the economic data section with the amendments indicated-

Works are currently in the implementation phase and the project is, from the current point of view, within budget and on schedule.

At Grafendorf, disassembly and demolition work has been completed and the erection/assembly phase has started. At Baumgarten, disassembly and demolition work is currently being carried out.

At Eggendorf, the erection/assembly phase is starting. Ruden is in the engineering phase.

<table>
<tr><th colspan="4">TAG 2016/01: TAG Reverse Flow Weitendorf/Eggendorf</th></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Planned completion:</td><td>Q4/2019</td></tr>
<tr><td>As of:</td><td>24 October 2017</td></tr>
<tr><td colspan="4">Project objective: Implementation of the TAG 2016/01 TAG Reverse Flow Weitendorf/Eggendorf project, which comprises operation of the Weitendorf CS and all necessary modifications of the station control system, will guarantee the transport to Baumgarten of at least 1.6 million Nm³/h (at least 1,000,000 Nm³/h at the Arnoldstein entry point and 600,000 Nm³/h at the Murfeld entry point).</td></tr>
<tr><td colspan="4">Please note in particular: Without a compressor station in operation, the maximum physical reverse flow possible at Baumgarten – while also complying with contractual obligations at the Austrian domestic exit points – is approximately 1,000,000 Nm³/h. This project is needed to guarantee the possibility of reverse flow operation of the Weitendorf and Eggendorf compressor stations.
The project fulfils the obligation imposed in the official decision PA 16870/15 issued by ECA in respect of the 2016-2025 CNDP, and in conjunction with projects TAG 2015/02, GCA 2015/08 and GCA 2015/10 will create new and non-competing freely allocable capacity at the Arnoldstein and Murfeld entry points.
The project was also submitted for inclusion in the 2017 TYNDP (TRA-N-954).
Possible impact on availability of transport capacities during implementation (Yes/No): YES</td></tr>
<tr><td colspan="2">Project description:
The following activities are planned:
– Creation of a connection from the SOL system to the low-pressure side of the compressor station (approx. 20 metres at DN 24") with corresponding valve and bypass
– Creation of a connection from the high-pressure side to TAG 2 (approx. 20 meters of DN 24") with corresponding valve and bypass in Eggendorf in order to enable reverse flow on two pipelines
– Update of the existing station control system at the Weitendorf CS and the Eggendorf CS.</td><td colspan="2"> 
</td></tr>
<tr><td colspan="4">Technical data: The project will permit flow at the Weitendorf CS to be reversed to allow the existing entry capacity at Arnoldstein and the planned new capacity at Murfeld to be transported towards Baumgarten while also fulfilling all contractual obligations at the domestic exit points. The project also involves a number of minor changes at the TAG CS to permit reverse flow under normal operating conditions with no need for intervention in Baumgarten.
Increase in technical reverse flow capacity in the TAG system: >1.6 million Nm³/h (0°C)</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2016 status): XXX€. The cost estimate is currently being evaluated by the engineering partner. The cost estimate may deviate by +/- 25%.</td></tr>
<tr><td colspan="4">Project rationale: The project fulfils the obligation imposed in the official decision PA 16870/15 issued by ECA in respect of the 2016-2025 CNDP, and in conjunction with projects TAG 2015/02, GCA 2015/08 and GCA 2015/10 will create new and non-competing freely allocable capacity at the Arnoldstein and Murfeld entry points.</td></tr>
<tr><td colspan="4">Project phase:
Status when initially submitted: Planning phase
2017 status: Planning phase</td></tr>
<tr><td colspan="2">TYNDP: yes</td><td>PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: The first version of the project was approved, subject to condition(s), in the official decision approving the 2016 CNDP (V KNEP G 01/16) on 23 September 2016.
TAG 2016/01 V1 – Updates to the previous version: planned completion (economic data has been updated</td></tr>
</table>

in the framework of the amendment)
Project status: The project is submitted for approval under the terms specified in the economic data section with the amendments indicated. The project is currently in the planning phase and within budget. The project set-up-study is currently being finalised and the next phase is about to commence.

TAG 2016/01: TAG Reverse Flow Weitendorf/Eggendorf	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk • **Quality (material, construction/commissioning, gas quality)** Medium risk, pipeline welding work • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Medium risk	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** No risk at present • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk • **Other projects** Low risk	

<table>
<tr><th colspan="4">TAG 2016/02 AZ1: Additional Entry and Connection with BOP13</th></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Planned completion:</td><td>Q3/2018</td></tr>
<tr><td>As of:</td><td>31 July 2017</td></tr>
<tr><td colspan="4">Project objective: The project objective is the entry of additional volume from the AZ1 entry point into the TAG system, as provided for in the upgrade to the GCA/2015/7b project, which will bring the entire 1,200,000 Nm³/h from AZ1 to the low-pressure side of the TAG Baumgarten CS. The project also includes connecting BOP13 to the AZ1 medium-pressure line.</td></tr>
<tr><td colspan="4">Please note in particular: Given that the works affect the same area, the project also includes a direct connection between BOP13 and the AZ1 medium-pressure line. This will also resolve the problem of BOP13 entering the TAG downstream the Baumgarten CS which caused numerous issues in winter 2014/15. It was for this reason that it was decided in September 2015 that a better solution was needed.

The project is directly linked to GCA 2015/02 / GCA 2015/02a (Entry Überackern) and GCA 2015/07b (Additional Demand in the Distribution Area) and GCA 2016/02 (Oberkappel N4G Interconnector).

Possible impact on availability of transport capacities during implementation (Yes/No): YES</td></tr>
<tr><td colspan="2">Project description:
The following activities are necessary for implementing the project:
– Replacement of the old 24" AZ1 medium-pressure line with a new 36" line up to the property boundary between the GCA/TAG pipelines
– Connection between AZ1 medium- and high-pressure lines; 2*24" valves
– Connection between BOP13 and the new AZ1 medium-pressure line</td><td colspan="2">  </td></tr>
<tr><td colspan="4">Technical data: Enables an increase in AZ1 entry as projected by GCA, eliminating any constraints in TAG Baumgarten operating mode in normal operation and enables a direct connection between the TAG pipeline and AZ1 and BOP13.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2016 status): XXX€. The cost estimate may deviate by +/- 25%.</td></tr>
<tr><td colspan="4">Project rationale: Project TAG 2016/02 will enable the entire entry flow of 1,200,000 Nm³/h from AZ1 to enter the TAG downstream the Baumgarten CS in standard operating mode.

As part of the same project, TAG will provide a direct connection between BOP13 and AZ1. This will resolve the historical problem of BOP13 entering the TAG downstream the Baumgarten CS, which caused numerous issues during winter 2014/2015 (to avoid such issues in future, TAG and GCA are finalising an operating procedure to be applied until this new project is implemented). So as to permit the maximum capacity from BOP13 and/or AZ1 from/to TAG, TAG will install a 36" connection to AZ1 up to the property boundary.</td></tr>
<tr><td colspan="4">Project phase:

Status when initially submitted: Planning phase
2017 status: Implementation phase</td></tr>
<tr><td colspan="2">TYNDP: no</td><td>PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: None</td></tr>
<tr><td colspan="4">Project status: The project was approved by the official decision approving the 2016 CNDP (V KNEP G 01/16) of 23 September 2016.

Works at Baumgarten are currently in the implementation phase and the project is within budget and on schedule. The elements of the TAG system will be implemented in coordination with the GCA system.</td></tr>
</table>

<table>
<tr><th colspan="4">TAG 2016/03: Reverse Flow Baumgarten MT Station (MS2)</th></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Planned completion:</td><td>3.5 years</td></tr>
<tr><td>As of:</td><td>20 November 2017</td></tr>
<tr><td colspan="4">Project objective: The new TAG 2016/03 project will facilitate physical reverse flow in the TAG system towards the Slovak network and other potential cross-border connections, which will improve security of supply in the regional as a whole, and was also submitted for inclusion in the 2017 TYNDP (TRA-N-954).</td></tr>
<tr><td colspan="4">Please note in particular: The project will permit flow at the TAG Baumgarten metering station to be reversed, enabling physical reverse flow towards Slovakia. This project should be viewed as an SoS project which will increase security of supply in Slovakia in particular. Project TAG 2016/01 is also necessary to achieve this objective.
Possible impact on availability of transport capacities during implementation (Yes/No): YES</td></tr>
<tr><td colspan="3">Project description:
The following activities are planned:
– Connection of the three TAG lines (using 24" pipe and valves) with the collector prior to the filters.
– Connection with TAG1 and TAG2 downstream of MS2 (using DN 40" pipe) (both towards SK).
– Reverse flow connection (using DN 40" pipe) downstream compression (on the collector) up to TAG1 and TAG2.</td><td> 
</td></tr>
<tr><td colspan="4">Technical data: The project comprises all activities required to reverse the direction of flow at the Baumgarten CS, including filtering, compression and metering of the gas towards Slovakia and adjustments to the station control system.
Baumgarten exit capacity: 1,000,000 Nm³/h</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2016 status): XXX€. The cost estimate may deviate by +/- 25%.</td></tr>
<tr><td colspan="4">Project rationale: Increase security of supply This project will enable interruptible capacity (UK) to be upgraded to freely allocable capacity (FZK) at the Baumgarten exit point.</td></tr>
<tr><td colspan="4">Project phase:
Status when initially submitted: Planning phase
2017 status: Planning phase</td></tr>
<tr><td colspan="2">TYNDP: yes</td><td>PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: The project was approved under conditions by the official decision approving the 2016 CNDP (V KNEP G 01/16) of 23 September 2016.
TAG 2016/03 V1 – changes from previous version: category of the project will be updates from "implementation project" to "planning project"; planned completion.</td></tr>
<tr><td colspan="4">Project status: The project was submitted for approval as a planning project under the terms specified in the economic data section with the amendments indicated.
The project set-up study was completed in Q1/2016. The project is currently in the planning phase and is within budget.</td></tr>
</table>

TAG 2016/03: Reverse Flow Baumgarten MT Station (MS2)	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** Medium risk, exploratory trench area. Filter separators required during define phase • **Infrastructure & existing facilities** Low risk • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** Medium risk, different pressure levels requested	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk, long-term framework agreement contractors • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Currently high risk, as no non-binding capacity was reported in the 2017 market survey.	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** No risk at present • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk • **Other projects** Medium risk, potential of competing marketing situation	

<table>
<tr><th colspan="4">TAG 2016/04: TAG Baumgarten Interconnection Capacity (Mosonmagyaróvár)</th></tr>
<tr><td>Project sponsor:</td><td>TAG GmbH</td><td>Planned completion:</td><td>Q4/2021</td></tr>
<tr><td colspan="2"></td><td>As of:</td><td>27 July 2017</td></tr>
<tr><td colspan="4">Project objective: The project objective is to create additional interconnection capacity on an FZK basis at Baumgarten with guaranteed access to the VTP, based on additional FZK capacity at the GCA Mosonmagyaróvár entry point. The project provides for modification of the TAG Baumgarten station to enable increased gas flow into the station.</td></tr>
<tr><td colspan="4">Please note in particular: The project is directly linked to the GCA 2015/05 Entry Mosonmagyaróvár project.
Possible impact on availability of transport capacities during implementation (Yes/No): None</td></tr>
<tr><td colspan="2">Project description:
The following activities are planned:
– Expansion of the Baumgarten interconnection infrastructure</td><td colspan="2"> 
</td></tr>
<tr><td colspan="4">Technical data: The following additional FZK interconnection capacity will be provided at Baumgarten:
Additional entry capacity: 570,000 Nm³/h (0°C)</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2016 status): XXX€. The cost estimate is currently being evaluated by the engineering partner. The cost estimate may deviate by +/- 25% due to uncertainties in the first planning phase.
Implementation of this project is subject to proof of economic viability in the form of binding long-term bookings at the Mosonmagyaróvár entry point.</td></tr>
<tr><td colspan="4">Project rationale: Increase of interconnection capacities and market liquidity in order to increase security of supply in Austria and Europe and provide alternative transport routes for alternative sources of supply.</td></tr>
<tr><td colspan="4">Project phase:
Status when initially submitted: Planning phase
2017 status: Planning phase</td></tr>
<tr><td>TYNDP: no</td><td>PCI status: no</td><td colspan="2">CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: None</td></tr>
<tr><td colspan="4">Project status: The project was approved as a planning project in the official decision approving the 2016 CNDP (V KNEP G 01/16) on 23 September 2016.
The first project set-up study was completed in Q4/2016. The next steps in this project depend on the next steps in the complementary GCA 2015/05 project. The project is currently within budget and on schedule.</td></tr>
</table>

TAG 2016/04: TAG Baumgarten Interconnection Capacity (Mosonmagyaróvár)	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk, long-term framework agreement contractors • **Markets** Low risk, market demand exists according to GCA • **Insurance** No risk at present • **Economic viability** Medium risk TAG project depends on next steps in GCA 2015/05 project	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** No risk at present • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk • **Other projects** Medium risk TAG project depends on next steps in GCA 2015/05 project	

<table>
<tr><th colspan="4">TAG 2016/05: TAG Baumgarten Interconnection Capacity (BACI)</th></tr>
<tr><td>Project sponsor:</td><td>TAG GmbH</td><td>Implementation time frame:</td><td>4.5 years</td></tr>
<tr><td colspan="2"></td><td>As of:</td><td>27 July 2017</td></tr>
<tr><td colspan="4">Project objective: The project objective is to create additional interconnection capacity on a freely allocable basis from/to the TAG system going to/coming from the Czech market (Reintal entry/exit point) with guaranteed access to the VTP, based on additional FZK capacity at the new GCA Reintal point. The project will ensure modification of the TAG Baumgarten station to enable increased interconnection gas flow.</td></tr>
<tr><td colspan="4">Please note in particular: The project is directly linked to the GCA 2015/01a project: Bidirectional Austria Czech Interconnector
Guaranteed access to the VTP will also be ensured.
Possible impact on availability of transport capacities during implementation (Yes/No): None</td></tr>
<tr><td colspan="2">Project description:
The following activities are planned:
– Expansion of the Baumgarten interconnection infrastructure</td><td colspan="2"> 
</td></tr>
<tr><td colspan="4">Technical data: The following additional FZK interconnection capacity will be provided at Baumgarten:
Additional entry capacity: 750,000 Nm³/h (0°C)
Additional exit capacity: 750,000 Nm³/h (0°C)</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2016 status): XXX€. The cost estimate is currently being evaluated by the engineering partner. The cost estimate may deviate by +/- 25% due to uncertainties in the first planning phase.
Implementation of this project is subject to proof of economic viability in the form of binding long-term bookings at the future Reintal entry/exit point.</td></tr>
<tr><td colspan="4">Project rationale: Increase interconnection capacities and market liquidity in order to foster the north-south corridor, reduce market isolation, increase security of supply in the Czech Republic and Austria and provide alternative transport routes for alternative sources of supply.</td></tr>
<tr><td colspan="4">Project phase:
Status when initially submitted: Planning phase
2017 status: Planning phase</td></tr>
<tr><td>TYNDP: no</td><td colspan="2">PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: The first project version was approved in the official decision approving the 2016 CNDP (V KNEP G 01/16) on 23 September 2016.
TAG 2016/05 V1 - changes from previous version: planned completion, project category will be updated from “planning project” to “implementation project”</td></tr>
<tr><td colspan="4">Project status: The project is submitted for approval as a planning project under the terms specified in the economic data section with the amendments indicated.
The first project set-up study was completed in Q4/2016. The next steps in this project depend on the next steps in the complementary GCA 2015/01a project. The project is currently within budget and on schedule and is in the planning phase.</td></tr>
</table>

TAG 2016/05: TAG Baumgarten Interconnection Capacity (BACI)	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** Medium risk, exploratory trench in built-up area required during DEFINE phase • **Infrastructure & existing facilities** Low risk • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk, long-term framework agreement contractors • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Medium risk, TAG project depends on next steps in GCA 2015/01a project	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** No risk at present • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk • **Other projects** Medium risk TAG project depends on next steps in GCA 2015/01a project	

<table>
<tr><th colspan="4">TAG 2016/06: TAG Baumgarten Interconnection Capacity (BBI)</th></tr>
<tr><td>Project sponsor:</td><td>TAG GmbH</td><td>Planned completion:</td><td>Q4/2020</td></tr>
<tr><td></td><td></td><td>As of:</td><td>27 July 2017</td></tr>
<tr><td colspan="4">Project objective: The project objective is to create additional interconnection capacity on a freely allocable basis from/to the TAG system going to/coming from the Czech market (Reintal entry/exit point) with guaranteed access to the VTP, based on additional FZK capacity at the new GCA Reintal point. The project will ensure modification of the TAG Baumgarten station to enable increased interconnection gas flow.</td></tr>
<tr><td colspan="4">Please note in particular: The project is directly linked to the GCA 2016/01 (Baumgarten Brezlav Interconnector) project. Guaranteed access to the VTP will also be ensured.</td></tr>
<tr><td colspan="2">Project description:
The following activities are planned:
– Expansion of the Baumgarten interconnection infrastructure</td><td colspan="2"> 
</td></tr>
<tr><td colspan="4">Technical data: The following additional FZK interconnection capacity will be provided at Baumgarten:
Additional entry capacity: 4,900,000 Nm³/h (0°C)
Additional exit capacity: 750,000 Nm³/h (0°C)</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2016 status): XXX€. The cost estimate is currently being evaluated by the engineering partner. The cost estimate may deviate by +/- XX% due to uncertainties in the first planning phase.
Implementation of this project is subject to proof of economic viability in the form of binding long-term bookings at the future Reintal entry/exit point.</td></tr>
<tr><td colspan="4">Project rationale: Increase interconnection capacities and market liquidity in order to foster the north-south corridor, reduce market isolation, increase security of supply in the Czech Republic and Austria and provide alternative transport routes for alternative sources of supply.</td></tr>
<tr><td colspan="4">Project phase: Planning phase</td></tr>
<tr><td>TYNDP: no</td><td colspan="2">PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: The first version of the project was approved subject to conditions in the official decision approving the 2016 CNDP (V KNEP G 01/16) on 23 September 2016.
The project will be withdrawn.</td></tr>
<tr><td colspan="4">Project status: The project will be withdrawn.</td></tr>
</table>

<table>
<tr><th colspan="4">TAG 2016/R07: DLE 1.5 + 72 Holes PT Module RC500 in CS Ruden</th></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Planned completion:</td><td>Q4/2017</td></tr>
<tr><td>As of:</td><td>26 July 2017</td></tr>
<tr><td colspan="4">Project objective: The objective is to upgrade the existing C500 gas generator of the PGT 25 DLE 1.0 type at the Ruden compressor station to the new DLE 1.5 technology.
Additionally, auxiliary systems such as, for example, fuel gas skid, blow-off valves and pipelines or isolation valves will be adjusted to the new gas generator.
Apart from that, the 46-hole casing flange is no longer available. The power turbine is therefore to be upgraded to the new 72-hole casing flange.</td></tr>
<tr><td colspan="4">Please note in particular: Possible impact on availability of transport capacities during implementation (Yes/No): None</td></tr>
<tr><td colspan="4">Project description:
The following investments are necessary for implementing the project:
– Exchange of the gas generator
– Exchange of the power turbine
– Exchange/adjustment of the auxiliary systems</td></tr>
<tr><td colspan="4">Technical data: The existing technical transport capacities will not change.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2016 status): XXX€. The cost estimate may deviate by +/- 25%.</td></tr>
<tr><td colspan="4">Project rationale: Instead of the major overhaul due (50,000 hours), an upgrade to the new DLE 1.5 technology is planned.
The upgrade of the gas generator to DLE 1.5 will reduce NOx and CO emissions pursuant to the state-of-the-art in technology.
The 46-hole casing flanges for PGT 25 gas turbines are obsolete and are no longer produced. In order to ensure reliable operations of the compressor units, the PGT 25 gas turbine with the 46-hole casing flange is to be upgraded to the new 72-hole casing flange.</td></tr>
<tr><td colspan="4">Project phase:
Status when initially submitted: Planning phase
2017 status: Implementation phase</td></tr>
<tr><td colspan="2">TYNDP: no</td><td>PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project status: The project was approved subject to conditions in the official decision approving the 2016 CNDP (V KNEP G 01/16) on 23 September 2016.
The project is within budget and on schedule. This project is in the implementation phase.
The cables from the machine to the control centre have been laid. Currently, wiring is being installed. The obsolete turbine elements have been fully disassembled. The new components are currently being installed.</td></tr>
</table>

TAG 2016/R07: DLE 1.5 + 72 Holes PT Module RC500 in CS Ruden	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk, plot is fenced in • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** No risk	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk, only to be connected to existing facilities • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Low risk	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** Low risk • **Plot (crossings, war relics, national heritage office, etc.)** No risk • **Acts of God** No risk • **Other projects** Low risk, coordination with other conversions	

<table>
<tr><th colspan="4">TAG 2016/R08: Major Overall Renewal of Gate Valve Stations Orth/Kaindorf/Finkenstein</th></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Planned completion:</td><td>Q4/2017</td></tr>
<tr><td>As of:</td><td>19 July 2017</td></tr>
<tr><td colspan="4">Project objective: The objective is to replace and/or renew equipment components, coatings and underground insulations, CPS (cathodic protection system) and fencing in three gate valve stations along the TAG pipeline system.</td></tr>
<tr><td colspan="4">Please note in particular: As part of the investment, existing equipment components and infrastructure will be replaced and/or renewed.
Possible impact on availability of transport capacities during implementation (Yes/No): None</td></tr>
<tr><td colspan="4">Project description:
– Renewal of coatings of valves and pipelines (above/below ground)
– Renewal of cathodic protection system
– Replacement of GOV (gas-hydraulic) actuators by EOV/EHOV (electro-hydraulic) actuators
– Renewal of grounding and lightning protection systems
– Paths and surfaces
– Repair of fences and gates</td></tr>
<tr><td colspan="4">Technical data: The existing technical transport capacity will not change.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2017 status): XXX€ according to cost estimate by EPCM contractor. The cost estimate may deviate by +/- 10%.</td></tr>
<tr><td colspan="4">Project rationale: The investment is necessary to maintain reliable and safe operations of the TAG pipeline system.</td></tr>
<tr><td colspan="4">Project phase:
Status when initially submitted: Planning phase (completion)
2017 status: Implementation phase</td></tr>
<tr><td colspan="2">TYNDP: no</td><td>PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: The first project version was approved in the official decision approving the 2016 CNDP (V KNEP G 01/16) on 23 September 2016.
TAG 2016/R08 V1 - changes from previous version: economic data</td></tr>
<tr><td colspan="4">Project status: The project is submitted for approval under the terms specified in the economic data section with the amendments indicated.</td></tr>
</table>

TAG 2016/R08: Major Overall Renewal of Gate Valve Stations Orth/Kaindorf/Finkenstein	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Medium risk	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** No risk at present • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk • **Other projects** Low risk	

<table>
<tr><td colspan="4">TAG 2016/R09: Exchange Leaking Valves St. Paul/Ruden/Ludmannsdorf/Arnoldstein</td></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Planned completion:</td><td>Q4/2019</td></tr>
<tr><td>As of:</td><td>24 October 2017</td></tr>
<tr><td colspan="4">Project objective: Replacement of 6 main line valves in the St. Paul, Ruden, Ludmannsdorf and Arnoldstein pipeline stations in order to ensure that the sections do not leak when closed.</td></tr>
<tr><td colspan="4">Please note in particular: As part of the investment, the existing valves with actuators will be exchanged and the related coatings of the pipeline system, the CPS (cathodic protection system) as well as the earthing and lightning protection systems will be replaced.
Possible impact on availability of transport capacities during implementation (Yes/No): YES</td></tr>
<tr><td colspan="4">Project description:
– Decompression of the pipeline section by means of recompression
– Excavation and digging works, exposing pipeline areas and valves
– Replacement of 6 valves
– Renewal of coatings and CPS
– Renewal of earthing and lightning protection systems
– Replacement of leaking valves
– Dismantling of the existing pig trap in Ludmannsdorf</td></tr>
<tr><td colspan="4">Technical data:
SS 12 L – St. Paul: TAG Loop II (40“) – VEOR 1L (main valve)
MOS-5 Ruden: TAG 1 (36“) – KVA 10 (pig receiver)
SS 14 AL – Ludmannsdorf: TAG Loop – VEOR 1L (40“), VEOR 11L (36’’) and VEOR 12L (36’’)
MOS 7 Arnoldstein: TAG 1 (36“) – MVEO 10

The existing technical transport capacity will not change.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2017 status): XXX€ according to cost estimate by EPCM contractor. The cost estimate may deviate by +/- 25%.</td></tr>
<tr><td colspan="4">Project rationale: The investment is necessary to provide reliable and safe operations of the TAG pipeline system.</td></tr>
<tr><td colspan="4">Project phase:
Status when initially submitted: Planning phase
2017 status: Implementation phase</td></tr>
<tr><td colspan="2">TYNDP: no</td><td>PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: The first project version was approved in the official decision approving the 2016 CNDP (V KNEP G 01/16) on 23 September 2016.
TAG 2016/R09 V1 - changes from previous version: project scope, project timeline, economic data</td></tr>
<tr><td colspan="4">Project status: The project is submitted for approval under the terms specified in the economic data section with the amendments indicated.</td></tr>
</table>

TAG 2016/R09: Exchange Leaking Valves St. Paul/ Rude/ Ludmannsdorf/ Arnoldstein	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk • **Quality (material, construction/commissioning, gas quality)** Medium risk, pipeline welding work • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Medium risk	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** No risk at present • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk • **Other projects** Low risk	

<table>
<tr><th colspan="4">TAG 2016/R10: Renewal Low-Voltage Main Switchgear Grafendorf</th></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Planned completion:</td><td>Q4/2017</td></tr>
<tr><td>As of:</td><td>31 July 2017</td></tr>
<tr><td colspan="4">Project objective: Renewal of the electrical switch gear components based on state-of-the-art technology. The works cover the following parts of the facility: metering facility, low-voltage room, battery room, fire protection and service building.
This project has already been implemented at two other compressor stations (Ruden and Baumgarten).</td></tr>
<tr><td colspan="4">Please note in particular: Possible impact on availability of transport capacities during implementation: YES</td></tr>
<tr><td colspan="4">Project description:
– Replacement of switchgear components
– Installation and replacement of switch cabinets, switches and cabling
– Replacement of UPS (uninterruptible power supply), new batteries
– Cabling in low-voltage room, battery room, metering facility, firefighting system
– Engineering, installation, E-TÜV certification and documentation</td></tr>
<tr><td colspan="4">Technical data: The existing technical transport capacity will not change.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2016 status): XXX€
The cost estimate is specified in an EPCM contract. The cost estimate may deviate by +/- 10%.</td></tr>
<tr><td colspan="4">Project rationale: The investment is necessary to ensure reliable and safe operations of the electrical switchgears of the TAG station.</td></tr>
<tr><td colspan="4">Project phase:
Status when initially submitted: Planning phase. EPCM contract ready for assignment
2017 status: Implementation phase</td></tr>
<tr><td colspan="2">TYNDP: no</td><td>PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: The first project version was approved in the official decision approving the 2016 CNDP (V KNEP G 01/16) on 23 September 2016.
TAG 2016/R10 V1 - changes from previous version: economic data</td></tr>
<tr><td colspan="4">Project status: The project was approved in the official decision approving the 2016 CNDP (V KNEP G 01/16) on 23 September 2016.
The project is currently on schedule. This project is in the implementation phase.</td></tr>
</table>

TAG 2016/R10: Renewal Low-Voltage Main Switchgear Grafendorf	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Medium risk • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk • **Markets** No risk at present7 • **Insurance** No risk at present • **Economic viability** Medium risk	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** No risk at present • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk • **Other projects** Low risk	

<table>
<tr><th colspan="4">TAG 2016/R11: Replacement of Gas-Hydraulic Actuators CS-BGT, GFD, RUD</th></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Planned completion:</td><td>Q4/2021</td></tr>
<tr><td>As of:</td><td>19 July 2017</td></tr>
<tr><td colspan="4">Project objective: Renewal of the existing gas-hydraulic by electro-hydraulic actuators at the Baumgarten, Grafendorf and Ruden compressor stations.</td></tr>
<tr><td colspan="4">Please note in particular: The actuators will be changed from gas-hydraulic (GOV) to electro-hydraulic (EHOV), thus reducing gas emissions in the long run.
Impact on availability of transport capacities: None</td></tr>
<tr><td colspan="4">Project description:
– Replacement of gas-hydraulic actuators (GOV) by electro-hydraulic actuators (EHOV)
– E/MSR connection of (EHOV) actuators from the electrical switchgear systems.
– Integration into the SCS (station control system)</td></tr>
<tr><td colspan="4">Technical data: No changes will be made to operations and processes and the existing technical transport capacity will not change.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2017 status): XXX€ according to cost estimate by EPCM contractor. The cost estimate may deviate by +/- 25%.</td></tr>
<tr><td colspan="4">Project rationale: The investment is necessary to maintain and ensure reliable and safe operations of the TAG pipeline system.</td></tr>
<tr><td colspan="4">Project phase:
Status when initially submitted: Planning phase
2017 status: Planning phase</td></tr>
<tr><td colspan="2">TYNDP: no</td><td>PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: The first project version was approved in the official decision approving the 2016 CNDP (V KNEP G 01/16) on 23 September 2016.
TAG 2016/R11 V1 - changes from previous version: planned completion (economic data has been updated in the framework of the amendment)</td></tr>
<tr><td colspan="4">Project status: The project is submitted for approval under the terms specified in the economic data section with the amendments indicated.
Currently the project is in the planning phase. Completion is currently planned for 2021.</td></tr>
</table>

TAG 2016/R11: Replacement of Gas-Hydraulic Actuators CS-BGT, GFD, RUD	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk • **Traffic** No risk at present • **Emissions** Medium risk, e.g.: bursting of the hydraulic tank and the pressurised containers • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Medium risk, implementation of new actuator signals in the existing station control systems (SCS) Medium risk, interaction between new actuator and old valves • **Quality (material, construction/commissioning, gas quality)** Medium risk, damage to the existing valves by testing the actuators (establishing the design parameters) Medium risk, faulty SIL classification of new actuators + valves • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** No risk at present	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** No risk at present • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk • **Other projects** Low risk	

TAG 2016/R12: Exchange of Station Control System (SCS), CS Ruden-Grafendorf-Baumgarten			
Project sponsor:	TAG GmbH	**Planned completion**	Q4/2021
		As of:	24 October 2017
Project objective: Replacement of SCS (station control system) and ESD (emergency shutdown) in hardware and software as well as replacement of marshalling cabinets and operable workstations and servers. At the metering facility, the mimic panel is to be replaced by a LED flat screen display.			
Please note in particular: Potential synergies with NOxER II vs. potential replacement of instruments, valves and loops, which need to be certified as required by SIL (safety integrity level). The cables now in use will not be changed. Possible impact on availability of transport capacities during implementation (Yes/No): YES			
Project description: – EPCM – Engineering & construction site supervision – Separate system integration for each compressor station – Separate commissioning for each compressor station			
Technical data: The existing technical transport capacity will not change.			
Economic data: Investment cost basis (2017 status): XXX€ (excl. potential replacement of control valves and fittings). The cost estimate is based on in-house experience. The cost estimate may deviate by +/- 25%.			
Project rationale: Due to the age of the system and the low availability of spare parts, TAG GmbH is required to renew the existing SCS at the Ruden, Grafendorf and Baumgarten compressor stations.			
Project phase: Status when initially submitted: Planning phase, EPCM contract award 2017 status: Engineering phase			
TYNDP: no	**PCI status:** no	**CBCA decision:** no	
Project modifications: The first project version was approved in the official decision approving the 2016 CNDP (V KNEP G 01/16) on 23 September 2016. TAG 2016/R12 V1 - changes from previous version: planned completion, planned costs			
Project status: The project is submitted for approval under the terms specified in the economic data section with the amendments indicated. The EPCM contract has been awarded. The tender for engineering and supervision of the construction site is pending.			

TAG 2016/R12: Exchange of Station Control System (SCS), CS Ruden-Grafendorf-Baumgarten	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** Medium risk, interfaces to existing technologies • **Operation (operability, maintainability, availability, etc.)** Medium risk, interfaces to existing technologies	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Medium risk	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** No risk at present • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk • **Other projects** Low risk	

<table>
<tr><th colspan="4">TAG 2017/01: TAG Baumgarten Interconnection Capacity (Mosonmagyaróvár) II</th></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Implementation time frame:</td><td>4.5 years</td></tr>
<tr><td>As of:</td><td>25 July 2017</td></tr>
<tr><td colspan="4">Project objective: The project objective is to create additional FZK capacity at the GCA Mosonmagyaróvár entry point and additional interconnection capacity on an FZK basis at Baumgarten with guaranteed access to the VTP. The project provides for modification of the TAG Baumgarten station to enable increased gas flow into the TAG system.</td></tr>
<tr><td colspan="4">Please note in particular: The project is directly linked to the GCA 2017/01 Entry Mosonmagyaróvár Plus project.
Possible impact on availability of transport capacities during implementation (Yes/No): None.</td></tr>
<tr><td colspan="2">Project description:
– The following activities are planned:
– Installation of a 32'' pipeline connection between the GCA and TAG pipeline systems, including valves and instruments
– Pipeline connection can be used in both directions
– Integration into the TAG process control system</td><td colspan="2"> 
</td></tr>
<tr><td colspan="4">Technical data: The following additional FZK interconnection capacity will be provided at Baumgarten:
Additional entry capacity: 1,000,000 Nm³/h (0°C), possible as TAG normal flow (SK=>AT) and TAG reverse flow (IT=>AT).</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2017 status): XXX€. The cost estimate may deviate by +/- 25%.
Implementation of this project is subject to proof of economic viability in the form of binding long-term bookings at the Mosonmagyaróvár entry point.</td></tr>
<tr><td colspan="4">Project rationale: Increase of interconnection capacities and market liquidity in order to increase security of supply in Austria and Europe and provide alternative transport routes for alternative sources of supply.</td></tr>
<tr><td colspan="4">Project phase: Planning phase.</td></tr>
<tr><td>TYNDP: no</td><td colspan="2">PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: None</td></tr>
<tr><td colspan="4">Project status: The project will be submitted as a implementation project for approval under the terms specified in the economic data section.</td></tr>
</table>

TAG 2017/01: TAG Baumgarten Interconnection Capacity (Mosonmagyaróvár) II	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk, long-term framework agreement contractors • **Markets** Low risk, market demand exists according to GCA • **Insurance** No risk at present • **Economic viability** Medium risk TAG project depends on next steps in GCA 2017/01 project	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** No risk at present • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk • **Other projects** Medium risk TAG project depends on next steps in GCA 2017/01 project	

<table>
<tr><th colspan="4">TAG 2017/R01: MS2 Refurbishment</th></tr>
<tr><td>Project sponsor:</td><td>TAG GmbH</td><td>Planned completion:</td><td>Q4/2019</td></tr>
<tr><td></td><td></td><td>As of:</td><td>24 October 2017</td></tr>
<tr><td colspan="4">Project objective: Replacement of the six 30'' underground pipeline sections downstream the MS2 metering lines.</td></tr>
<tr><td colspan="4">Please note in particular: Possible impact on availability of transport capacities during implementation (Yes/No): None</td></tr>
<tr><td colspan="2">Project description:
– Disassembly of the MS2 metering building including the existing measurement shaft/density measurements
– Disassembly and replacement of the six 30'' underground pipeline sections downstream the MS2 metering building up to the outlet valves of the metering lines
– Restoration of a new blow-off system on site</td><td colspan="2">  </td></tr>
<tr><td colspan="4">Technical data: The existing technical transport capacity will not change.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2017 status): XXX€ according to cost estimate by EPCM contractor. The cost estimate may deviate by +/- 25%.</td></tr>
<tr><td colspan="4">Project rationale: The investment is necessary to provide reliable and safe operations of the TAG pipeline system.</td></tr>
<tr><td colspan="4">Project phase: Planning phase</td></tr>
<tr><td>TYNDP: no</td><td colspan="2">PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: None</td></tr>
<tr><td colspan="4">Project status: The project will be submitted as a project for approval under the terms specified in the economic data section.
Construction work and underground work are scheduled to begin and to be completed in 2019.</td></tr>
</table>

TAG 2017/R01: MS2 Refurbishment	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** Medium risk, tightness of inlet/outlet valves of metering route	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk, long-term framework agreement contractors • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Lower risk	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** No risk at present • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk • **Other projects** Low risk	

<table>
<tr><td colspan="4">TAG 2017/R02: Major Overhaul Renewal of Valve Stations, Lichtenegg/Wielfresen 1/Ettendorf/Ludmannsdorf</td></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Planned completion:</td><td>Q4/2019</td></tr>
<tr><td>As of:</td><td>24 October 2017</td></tr>
<tr><td colspan="4">Project objective: The objective is to replace and/or renew equipment components, coatings and underground insulations, CPS (cathodic protection system) and fencing in the Lichtenegg, Wielfresen 1, Ludmannsdorf and Ettendorf gate valve stations along the TAG pipeline system.</td></tr>
<tr><td colspan="4">Please note in particular: As part of the investment, existing equipment components and infrastructure will be replaced and/or renewed.
Possible impact on availability of transport capacities during implementation (Yes/No): No</td></tr>
<tr><td colspan="4">Project description:
– Renewal of coatings of valves and pipelines (above/below ground)
– Renewal of cathodic protection system
– Replacement of GOV (gas-hydraulic) actuators by EOV/EHOV (electro-hydraulic) actuators
– Replacement of the E/I Container
– Renewal of earthing and lightning protection systems
– Paths and surfaces
– Renewal of fences and gates</td></tr>
<tr><td colspan="4">Technical data: So far no reduction of the available transport capacity is foreseen.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2017 status): XXX€ according to cost estimate by EPCM contractor. The cost estimate may deviate by +/- 25%.</td></tr>
<tr><td colspan="4">Project rationale: The investment is necessary to maintain reliable and safe operations of the TAG pipeline system.</td></tr>
<tr><td colspan="4">Project phase: Planning phase</td></tr>
<tr><td colspan="2">TYNDP: no</td><td>PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: None</td></tr>
<tr><td colspan="4">Project status: The project will be submitted for approval under the terms specified in the economic data section.</td></tr>
</table>

TAG 2017/R02: Major Overhaul Renewal of Valve Stations, Lichtenegg/Wielfresen 1/Ettendorf/Ludmannsdorf	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk • **Quality (material, construction/commissioning, gas quality)** Medium risk, pipeline welding work • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Medium risk	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** No risk at present • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk • **Other projects** Low risk	

<table>
<tr><td colspan="4">TAG 2017/R03: Major Overhaul Renewal of Valve Stations Lanzenkirchen/ Sulmeck/ St.Paul/ Ruden/ Arnoldstein</td></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Planned completion:</td><td>Q4/2019</td></tr>
<tr><td>As of:</td><td>19 July 2017</td></tr>
<tr><td colspan="4">Project objective: The scope of the project is to replace and/or renew instruments, coatings and underground insulations, CPS (cathodic protection system) and enclosures in the section valve stations along the TAG-pipeline system (Lanzenkirchen, Sulmeck, St.Paul, Ruden and Arnoldstein).</td></tr>
<tr><td colspan="4">Please note in particular: As part of the investment, existing equipment components and infrastructure will be replaced and/or renewed. This project is linked up with the project “2016/R09: Exchange leaking valves St. Paul / Ruden / Arnoldstein / Ludmannsdorf”.
Possible impact on availability of transport capacities during implementation (Yes/No): None</td></tr>
<tr><td colspan="4">Project description:
– Renewal of coatings of valves and pipelines (above/below ground)
– Renewal of cathodic protection system
– Replacement of GOV (gas-hydraulic) actuators by EOV/EHOV (electro-hydraulic) actuators
– Renewal of grounding and lightning protection systems
– Paths and surfaces
– Renewal of fences and gates</td></tr>
<tr><td colspan="4">Technical data: The existing technical transport capacity will not change.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2017 status): XXX€ according to cost estimate by EPCM contractor. The cost estimate may deviate by +/- 25%.</td></tr>
<tr><td colspan="4">Project rationale: The investment is necessary to maintain reliable and safe operations of the TAG pipeline system.</td></tr>
<tr><td colspan="4">Project phase: Planning phase</td></tr>
<tr><td>TYNDP: no</td><td colspan="2">PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: None</td></tr>
<tr><td colspan="4">Project status: The project will be submitted as a project for approval under the terms specified in the economic data section.</td></tr>
</table>

TAG 2017/R03: Major Overhaul Renewal of Valve Stations Lanzenkirchen/Sulmeck/St.Paul/ Ruden/ Arnoldstein	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Medium risk	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** No risk at present • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk • **Other projects** Low risk	

<table>
<tr><td colspan="4">TAG 2017/R04: CS Baumgarten Grafendorf Ruden Substitution Gas Hydraulic Actuators TUCO</td></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Planned completion:</td><td>Q4/2019</td></tr>
<tr><td>As of:</td><td>24 October 2017</td></tr>
<tr><td colspan="4">Project objective: Replacement of the existing gas-hydraulic actuators by electro-hydraulic actuators in the turbo compressors at the Baumgarten, Grafendorf and Ruden compressor stations</td></tr>
<tr><td colspan="4">Please note in particular: The actuators will be changed from gas-hydraulic (GOV) to electro-hydraulic (EHOV), thus reducing gas emissions in the long run.
Possible impact on availability of transport capacities during implementation (Yes/No): None</td></tr>
<tr><td colspan="4">Project description:
– Replacement of gas-hydraulic actuators (GOV) by electro-hydraulic actuators (EHOV)
– E/MSR connection of (EHOV) actuators from the electrical switchgear systems.
– Integration into the SCS (station control system)</td></tr>
<tr><td colspan="4">Technical data: No changes will be made to operations and processes and the existing technical transport capacity will not change.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2017 status): XXX€ according to cost estimate by EPCM contractor. The cost estimate may deviate by +/- 25%.</td></tr>
<tr><td colspan="4">Project rationale: The investment is necessary to maintain and ensure reliable and safe operations of the TAG pipeline system.</td></tr>
<tr><td colspan="4">Project phase: Planning phase</td></tr>
<tr><td>TYNDP: no</td><td colspan="2">PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: None</td></tr>
<tr><td colspan="4">Project status: The project will be submitted for approval under the terms specified in the economic data section.</td></tr>
</table>

TAG 2017/R04: CS Baumgarten Grafendorf Ruden Substitution Gas Hydraulic Actuators TUCO	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk • **Traffic** No risk at present • **Emissions** Medium risk, e.g.: bursting of the hydraulic tank and the pressurised containers • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Medium risk, implementation of new actuator signals in the existing station control systems (SCS) Medium risk, interaction between new actuator and old valves • **Quality (material, construction/commissioning, gas quality)** Medium risk, damage to the existing valves by testing the actuators (establishing the design parameters) Medium risk, faulty SIL classification of new actuators + valves • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** No risk at present	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** No risk at present • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk • **Other projects** Low risk	

<table>
<tr><td colspan="4">TAG 2017/R05: Baumgarten Filter Separators & Metering Station MS2 Electrical Actuators</td></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Planned completion:</td><td>Q4/2019</td></tr>
<tr><td>As of:</td><td>24 October 2017</td></tr>
<tr><td colspan="4">Project objective: Replacement of the existing electrical actuators by new electrical actuators at the Baumgarten compressor station (in the filter separators and metering route 2)</td></tr>
<tr><td colspan="4">Please note in particular: Possible impact on availability of transport capacities during implementation (Yes/No): None</td></tr>
<tr><td colspan="4">Project description:
– Replacement of electrical actuators by new electrical actuators
– Integration into the SCS (station control system)</td></tr>
<tr><td colspan="4">Technical data: No changes will be made to operations and processes and the existing technical transport capacity will not change.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2017 status): XXX€ according to cost estimate by EPCM contractor. The cost estimate may deviate by +/- 25%.</td></tr>
<tr><td colspan="4">Project rationale: The investment is necessary to maintain and ensure reliable and safe operations of the TAG pipeline system.</td></tr>
<tr><td colspan="4">Project phase: Planning phase</td></tr>
<tr><td>TYNDP: no</td><td colspan="2">PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: None</td></tr>
<tr><td colspan="4">Project status: The project will be submitted for approval under the terms specified in the economic data section.
Basic engineering has been completed. Procurement of electrical actuators is currently pending.</td></tr>
</table>

TAG 2017/R05: Baumgarten Filter Separators & Metering Station MS2 Electrical Actuators	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Medium risk, implementation of new actuator signals in the existing station control systems (SCS) Low risk, interaction between new actuator and old valves • **Quality (material, construction/commissioning, gas quality)** Low risk, damage to the existing valves by testing the actuators (establishing the design parameters) Medium risk, faulty SIL classification of new actuators + valves • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** No risk at present	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** No risk at present • **Plot (crossings, war relics, national heritage office, etc.)** No risk at present • **Acts of God** Low risk • **Other projects** Low risk	

<table>
<tr><td colspan="4">TAG 2017/R06: DLE 1.5 + 72 Hole PT Module RC400 in CS-Ruden</td></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Planned completion:</td><td>Q4/2018</td></tr>
<tr><td>As of:</td><td>26 July 2017</td></tr>
<tr><td colspan="4">Project objective: The objective is to upgrade the existing C400 gas generator of the PGT 25 DLE 1.0 type at the Ruden compressor station with the new DLE 1.5 XTend technology.

Additionally, auxiliary systems such as, for example, fuel gas skid, blow-off valves and pipelines or isolation valves will be adjusted to the new gas generator.

Apart from that, the 46-hole casing flange is no longer available. The power turbine is therefore to be upgraded to the new 72-hole casing flange.</td></tr>
<tr><td colspan="4">Please note in particular: Possible impact on availability of transport capacities during implementation (Yes/No): None</td></tr>
<tr><td colspan="4">Project description:
The following investments are necessary for implementing the project:
– Exchange of the gas generator
– Exchange of the power turbine
– Exchange/adjustment of the auxiliary systems.</td></tr>
<tr><td colspan="4">Technical data: The existing technical transport capacities will not change.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2017 status): XXX€
The cost estimate may deviate by +/- 25%.</td></tr>
<tr><td colspan="4">Project rationale: Instead of the major overhaul due (50,000 hours), an upgrade to the new DLE 1.5 XTend technology is planned.
The upgrade of the gas generator to DLE 1.5 will reduce NOx and CO emissions pursuant to the state-of-the-art in technology. Using XTend components at the gas generator allows for skipping the maintenance at 25,000 operating hours and reduces maintenance costs.
The 46-hole casing flanges for PGT 25 gas turbines are obsolete and are no longer produced. In order to ensure reliable operations of the compressor units, the PGT 25 gas turbine with the 46-hole casing flange is to be upgraded to the new 72-hole casing flange.</td></tr>
<tr><td colspan="4">Project phase: Implementation phase</td></tr>
<tr><td>TYNDP: no</td><td colspan="2">PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: None</td></tr>
<tr><td colspan="4">Project status: The project will be submitted for approval under the terms specified in the economic data section.</td></tr>
</table>

TAG 2017/R06: DLE 1.5 + 72 Hole PT Module RC400 in CS-Ruden	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk, plot is fenced in • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** No risk	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk, only to be connected to existing facilities • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Low risk	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** Low risk • **Plot (crossings, war relics, national heritage office, etc.)** No risk • **Acts of God** No risk • **Other projects** Low risk, coordination with other conversions	

<table>
<tr><td colspan="4">TAG 2017/R07: Gas Generator BC800 in CS-Baumgarten</td></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Planned completion:</td><td>Q1/2019</td></tr>
<tr><td>As of:</td><td>24 October 2017</td></tr>
<tr><td colspan="4">Project objective: A hot section inspection (25,000 operating hours) of the gas generator at the Baumgarten C800 compressor unit is planned for 2018. The objective of this project is to carry out a minor overhaul instead of the regular major overhaul and to upgrade the gas generator to the XTend version.</td></tr>
<tr><td colspan="4">Please note in particular: Possible impact on availability of transport capacities during implementation (Yes/No): None</td></tr>
<tr><td colspan="4">Project description:
– Gas generator LM2500 base DLE 1.5 XTend® conversion kit
• HPT rotor assembly with Xtend stage 1 and 2 blades
• HPT S1 nozzle assembly with Xtend™ S1 nozzles
• HPT S2 nozzle assembly with Xtend™ S2 nozzles, including
o stage 1 and 2 shrouds
o Interstage shield
o Cooling air tube
– Overhaul activities
– Service bulletin implementation
Gas generator work shop activities & test</td></tr>
<tr><td colspan="4">Technical data: The existing technical transport capacities will not change.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2017 status): XXX €
The cost estimate may deviate by +/- 25%.</td></tr>
<tr><td colspan="4">Project rationale: Instead of the hot section inspection due (25,000 hours), an upgrade to the new DLE 1.5 XTend technology is planned.
The gas generator's upgrade to the XTend version will allow for skipping maintenance services at 25,000 hours and for carrying out maintenance services only at 50,000 hours, which reduces maintenance costs and maintenance-related downtime.</td></tr>
<tr><td colspan="4">Project phase: Engineering phase</td></tr>
<tr><td>TYNDP: no</td><td colspan="2">PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: None</td></tr>
<tr><td colspan="4">Project status: The project will be submitted for approval under the terms specified in the economic data section.</td></tr>
</table>

TAG 2017/R07: Gas Generator BC800 in CS-Baumgarten	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk, plot is fenced in • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** No risk	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk, only to be connected to existing facilities • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Low risk	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** Low risk • **Plot (crossings, war relics, national heritage office, etc.)** No risk • **Acts of God** No risk • **Other projects** Low risk, coordination with other conversions	

<table>
<tr><td colspan="4">TAG 2017/R08: Gas Generator RC600 in CS-Ruden</td></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Planned completion:</td><td>Q4/2019</td></tr>
<tr><td>As of:</td><td>24 October 2017</td></tr>
<tr><td colspan="4">Project objective: A hot section inspection (25,000 operating hours) of the gas generator at the Ruden C600 compressor unit is planned for 2019. The objective of this project is to carry out a minor overhaul instead of the regular major overhaul and to upgrade the gas generator to the XTend version.</td></tr>
<tr><td colspan="4">Please note in particular: Possible impact on availability of transport capacities during implementation (Yes/No): None</td></tr>
<tr><td colspan="4">Project description:
– Gas Generator LM2500 Base DLE 1.5 XTend® conversion Kit
• HPT rotor assembly with Xtend Stage 1 and 2 blades
• HPT S1 Nozzle assembly with Xtend™ S1 nozzles
• HPT S2 Nozzle assembly with Xtend™ S2 nozzles, including
o stage 1 and 2 shrouds
o Interstage shield
o Cooling air tube
– Overhaul activities
– Service Bulletin implementation
– Gas Generator Work Shop Activities & Test</td></tr>
<tr><td colspan="4">Technical data: The existing technical transport capacities will not change.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2017 status): XXX€
The cost estimate may deviate by +/- 25%.</td></tr>
<tr><td colspan="4">Project rationale: Instead of the hot section inspection due (25,000 hours), an upgrade to the new DLE 1.5 XTend technology is planned.
The gas generator's upgrade to the XTend version will allow for skipping maintenance services at 25,000 hours and for carrying out maintenance services only at 50,000 hours, which reduces maintenance costs and maintenance-related downtime.</td></tr>
<tr><td colspan="4">Project phase: Engineeringphase</td></tr>
<tr><td>TYNDP: no</td><td colspan="2">PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: None</td></tr>
<tr><td colspan="4">Project status: The project will be submitted for approval under the terms specified in the economic data section.</td></tr>
</table>

TAG 2017/R08: Gas Generator RC600 in CS-Ruden	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk, plot is fenced in • **Traffic** No risk at present • **Emissions** No risk at present • **Reputation** No risk	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk, only to be connected to existing facilities • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Low risk	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** Low risk • **Plot (crossings, war relics, national heritage office, etc.)** No risk • **Acts of God** No risk • **Other projects** Low risk, coordination with other conversions	

<table>
<tr><th colspan="4">TAG 2017/R10 Sec.3: Replacement of TAG I Damaged Insulation</th></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Planned completion:</td><td>Q4/2017</td></tr>
<tr><td>As of:</td><td>26 July 2017</td></tr>
<tr><td colspan="4">Project objective: In some sections of the TAG pipeline system the insulation protecting the pipeline from corrosion needs repair. Nine sections in Styria and Carinthia with a total length of 2,380 m are affected.</td></tr>
<tr><td colspan="4">Please note in particular: If asbestos-containing material is detected in the damaged insulation, protection measures for humans, animals and the environment need to be taken.
Possible impact on availability of transport capacities during implementation (Yes/No): None</td></tr>
<tr><td colspan="4">Project description:
The following steps need to be taken:
– Excavation of the faulty patch
– Measures to prevent asbestos fibres from spreading, if applicable
– Removal of the insulation/sandblasting
– Application of new insulation
– Re-filling / soil re-cultivation</td></tr>
<tr><td colspan="4">Technical data: The existing technical transport capacities will not change.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2017 status): XXX€
The cost estimate may deviate by +/- 10%.</td></tr>
<tr><td colspan="4">Project rationale: As a result of the most recent intensive measurement (performed by GCA between 2012 and 2014), the insulation protecting the pipeline from corrosion needs repair in some sections of the TAG pipeline system (Styria and Carinthia). The insulation damage was categorised into three different priority levels. The most critical faulty patches (class 1) need to be addressed in 2016/2017; nine sections in Styria and Carinthia with a total length of 2,380 m are affected.</td></tr>
<tr><td colspan="4">Project phase: Implementation phase</td></tr>
<tr><td colspan="2">TYNDP: no</td><td>PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: None</td></tr>
<tr><td colspan="4">Project status: Repair of the Styrian pipeline sections was already completed in 2016. Repair of the faulty patches in Carinthia is pending. The project is within budget and on schedule.
The project will be submitted for approval under the terms specified in the economic data section.</td></tr>
</table>

TAG 2017/R10 Sec.3: Replacement of TAG I Damaged Insulation	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk, plot will be fenced in • **Traffic** Low risk • **Emissions** No risk at present • **Reputation** Low risk, local residents	
Technical risks • **Surface/subsurface** Low risk • **Infrastructure & existing facilities** Low risk, only to be connected to existing facilities • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** Low risk	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** Low risk • **Plot (crossings, war relics, national heritage office, etc.)** Medium risk, easements time-critical for pipeline projects • **Acts of God** Low risk, delays due to weather • **Other projects** No risk	

<table>
<tr><th colspan="4">TAG 2017/R11 Sec.1: Refurbishment Sec Ball Valve SS1 (Orth)</th></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Planned completion</td><td>Q3/2017</td></tr>
<tr><td>As of:</td><td>26 July 2017</td></tr>
<tr><td colspan="4">Project objective: As the main pipeline valves at the Orth/Donau VAR1 (Nuovo Pignone Bari) gate valve stations are leaking, the ball valves need repair. The new valve actuator of the General Refurbishment Section Valve Stations project will be mounted on the repaired valves. Recompression is necessary to perform repair.</td></tr>
<tr><td colspan="4">Please note in particular: The project is to be coordinated with the General Refurbishment Section Valve Stations project in order to use synergies such as excavation work, which is required for both projects.
Possible impact on availability of transport capacities during implementation (Yes/No): None; as the project is coordinated with the NOxER II project at the Baumgarten CS, there is no additional reduction of technical capacity.</td></tr>
<tr><td colspan="4">Project description:
– Recompression of gas in the pipeline affected
– Opening and repair of leaking valves
– Refilling and commissioning the pipeline affected</td></tr>
<tr><td colspan="4">Technical data: The existing technical transport capacity will not change.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2017 status): XXX€
The cost estimate is based on related in-house experience and may deviate by +/- 10%.</td></tr>
<tr><td colspan="4">Project rationale: As the main pipeline valves at the Orth/Donau VAR1 (Nuovo Pignone Bari) gate valve stations are leaking, the ball valves need repair. The new valve actuator of the General Refurbishment Section Valve Stations project will be mounted on the repaired valves. Recompression is necessary to perform repair.</td></tr>
<tr><td colspan="4">Project phase: Implementation phase</td></tr>
<tr><td colspan="2">TYNDP: no</td><td>PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: None</td></tr>
<tr><td colspan="4">Project status: The project will be submitted for approval under the terms specified in the economic data section.
The valves have already been repaired and the pipeline section affected has been re-pressurised and recommissioned. The project is within budget and on schedule.</td></tr>
</table>

TAG 2017/R11 Sec.1: Refurbishment Sec Ball Valve SS1 (Orth)	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk, plot is fenced in • **Traffic** No risk at present • **Emissions** Low risk, re-compression will be carried out • **Reputation** No risk	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk, greenfield projects, only to be connected to existing facilities • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk, interconnection agreements • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** No risk	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** Low risk • **Plot (crossings, war relics, national heritage office, etc.)** No risk, easements time-critical for pipeline projects • **Acts of God** Low risk, delays due to weather • **Other projects** Low risk, coordination with other conversions	

<table>
<tr><td colspan="4">TAG 2017/R12 CS-E: Repl. Insulation Joint Loop2</td></tr>
<tr><td rowspan="2">Project sponsor:</td><td rowspan="2">TAG GmbH</td><td>Planned completion</td><td>Q3/2017</td></tr>
<tr><td>As of:</td><td>26 July 2017</td></tr>
<tr><td colspan="4">Project objective: Replacement of the faulty insulating joint of TAG Loop II at the exit of Eggendorf CS (section 1, Eggendorf-Lanzenkirchen).</td></tr>
<tr><td colspan="4">Please note in particular: Possible impact on availability of transport capacities during implementation (Yes/No): The technical capacity is currently expected to be reduced to 76% for a period of 10 days.</td></tr>
<tr><td colspan="4">Project description:
Necessary steps:
– Recompression of the section affected
– Replacement of the insulating joint</td></tr>
<tr><td colspan="4">Technical data: The existing technical transport capacity will not change.</td></tr>
<tr><td colspan="4">Economic data: Investment cost basis (2017 status): XXX€
The cost estimate is based on related in-house experience and may deviate by +/- 10%.</td></tr>
<tr><td colspan="4">Project rationale: During the most recent intensive measurement of the pipeline's cathodic protection system a high-impedance bypass of the insulating joint was detected.
The pipeline was cleaned using a cleaning pig. The previous spark gap was checked and renewed by the company V&C. After another check, the problem still exists. The insulating joint no longer fulfils its purpose and there is a 1V impact.

The insulating joint needs to be replaced.</td></tr>
<tr><td colspan="4">Project phase: Implementation phase</td></tr>
<tr><td>TYNDP: no</td><td colspan="2">PCI status: no</td><td>CBCA decision: no</td></tr>
<tr><td colspan="4">Project modifications: None</td></tr>
<tr><td colspan="4">Project status: The project is within budget and on schedule.
The project will be submitted for approval under the terms specified in the economic data section.</td></tr>
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TAG 2017/R12 CS-E: Repl. Insulation Joint Loop2	Qualitative risk assessment
HSE risks • **Accidents involving personal injury, damage to property and environmental damage** Medium risk at all times • **Burglary at construction site** Low risk, plot is fenced in • **Traffic** No risk at present • **Emissions** Low risk, re-compression will be carried out • **Reputation** No risk	
Technical risks • **Surface/subsurface** No risk at present • **Infrastructure & existing facilities** Low risk, greenfield projects, only to be connected to existing facilities • **Quality (material, construction/commissioning, gas quality)** No risk at present • **Emerging technologies** No risk at present • **Operation (operability, maintainability, availability, etc.)** No risk at present	
Economic risks • **Suppliers, partners** Low risk, long lead items • **Contracting** Low risk, interconnection agreements • **Markets** No risk at present • **Insurance** No risk at present • **Economic viability** No risk	
Project environment • **Legal framework, authorities, easements** No risk at present • **Stakeholders and political environment** Low risk • **Plot (crossings, war relics, national heritage office, etc.)** No risk • **Acts of God** Low risk, delays due to weather • **Other projects** Low risk, coordination with other conversions