Risikogruppe „Gasversorgung Nordafrika, Libyen" (HR, IT [Koordination], MT, AT, SI):

*1. **Beschreibung des Netzes***

1.1. Geben Sie eine kurze zusammengefasste Beschreibung des regionalen Gasnetzes für jede Risikogruppe (2), an der der Mitgliedstaat teilnimmt, mit folgenden Angaben:
a) die wichtigsten Gasverbrauchszahlen (3): jährlicher Endgasverbrauch (Mrd. m3 und MWh) und Aufschlüsselung nach Art der Kunden (4), Spitzennachfrage (insgesamt und aufgeschlüsselt nach Kategorie der Verbraucher in Mio. m3/Tag),
b) eine Beschreibung der Funktionsweise des/der Gasnetze(s) in den betreffenden Risikogruppen: Hauptgasflüsse (Einspeisung/Ausspeisung/Durchleitung), Kapazität der Infrastruktur der Einspeise-/Ausspeisepunkte für den Transport in die und aus der/den Region(en) der Risikogruppen und je Mitgliedstaat (einschließlich Nutzungsrate), LNG-Anlagen (maximale tägliche Kapazität, Nutzungsrate und Zugangsregelung) usw.,
c) eine prozentuale Aufschlüsselung, soweit möglich, der Gasimportquellen nach Herkunftsland (5),
d)eine Beschreibung der Rolle der für die Risikogruppe relevanten Speicheranlagen, einschließlich des grenzüberschreitenden Zugangs:
i) Speicherkapazität (insgesamt und Arbeitsgas) im Vergleich zur Nachfrage während der Heizperiode, ii) maximale tägliche Entnahmekapazität bei unterschiedlichen Füllständen (idealerweise bei vollen Speichern und bei Füllständen am der am Ende der Heizperiode);
e) eine Beschreibung der Rolle der heimischen Produktion in der/den Risikogruppe(n):
i) Produktionsmenge im Vergleich zum jährlichen Endgasverbrauch,
ii) maximale tägliche Produktionskapazität sowie eine Beschreibung, wie diese den maximalen täglichen Verbrauch decken kann;
f) eine Beschreibung der Rolle von Gas bei der Stromerzeugung (z. B. Bedeutung und Rolle als Ersatz für erneuerbare Energien) unter Einbeziehung der Erzeugungskapazität von Gaskraftwerken (insgesamt (MWe) und als Prozentsatz der gesamten Erzeugungskapazität) und der Kraft-Wärme-Kopplung (insgesamt (MWe) und als Prozentsatz der gesamten Erzeugungskapazität).

Croatia

Croatian gas transmission network has a total length of 2.694 km of transportation pipelines. The natural gas transmission network has cross-border interconnections with Slovenia (Rogatec) and Hungary (Dravaszerdahely) usually utilised to import gas. There are also 7 entry points from production plants and one interconnection with the underground storage facility of Okoli.
The upstream pipelines in the Adriatic sea are used to export Croatian natural gas from the production platforms to Italy. Panon gas fields are connected by upstream pipelines to the transmission network and to the underground gas storage facility at the Okoli site.

The Okoli gas storage infrastructure (553 million cubic meters) is located at Okoliand and it is part of the Underground Gas Station d.o.o..

Croatia is going to build an LNG terminal on the island of Krk, with a storage capacity from up to 265.000 m3 of LNG; nominal regasification capacity of 8 billion m3 of gas per year.
In 2016 natural gas consumption amounted to 106 MSm3.


HUNGARY
Kidričevo
Nagykanizsa
413
MGP
Sempeter
Gorizia
LJUBLJANA
30
Rogatec
29
Ajdovščina
SLOVENIA
ZAGREB
Dravaszerdahely
Sombor
Lučko
58
Trieste
Donji Miholac
Karlovac
Osijek
Rijeka
Krk
Omisalj
Sotin
Bačko N
Lička
Jasenica
Vel. Kladusa
Slobodnica
Vodnjan
Krk
Rakovica
Trzac
Cazin
Brod
Pula
Bos. Krupa
Modrica
Bihač
Banja Luka
Gospič
BOSNIA
HERZEGOVINA
CROATIA
Travnik
49
Zenica
Zvornik
Zadar
Knin
G.Vakuf
Benkovac
Ancona
Kiseljac
SARAJEVO
Recanati
Posušje
Split
Imotski
Mostar
IAP
Adriatic Sea
Ploče
Cellino
IAP
MONTENE
ADRIATICA PIPELINE
Chieti
Aquila
PODGORICA

Italy

Italian gas transmission network extends for more than 32.000 km. The national network has cross-border interconnection points with Austria (Tarvisio/Arnoldstein), Slovenia (Gorizia/Sempeter) and with Switzerland (Griess Pass). Italy is also supplied through two off shore interconnectors: Transmed (with Tunisia and Algeria) and Greenstream (Libya). A new interconnection facility (TAP) is in progress and will be operational in 2020. There are three entry points from LNG terminals (Panigaglia, Livorno and Cavarzere) and twelve entry exit point from storage plants for an overall volume of approximately 17 GSm3. Local production (5.6 GSm3/y in 2016) shows a historical decreasing trend due to the decline of domestic sources, not sufficiently offset by new production developments.

In 2017, total natural gas consumption amounted to 75,1 GSm3.

Malta

In January 2017, Malta began its gas supply thanks to the new floating storage and regasification unit at Delimara, which supplies gas to the new power plant.

The terminal has a total LNG storage capacity of 125.000 m3 and a maximum send-out capacity of 165 GWh/d (≈15 MSm3/d).

Until now, Malta has purchased LNG from the following countries of origin:

(a) Netherlands;
(b) USA;
(c) Equatorial Guinea;
(d) Egypt;
(e) Trinidad.

Slovenia

The Slovenian transmission network has cross-border interconnections with Austria (Murfeld/Ceršak interconnection point), with Italy (Gorizia/Šempeter) and an exit only point with Croatia (Rogatec). Slovenian gas system has no storage facilities nor any local gas production. The gas consumption figures from 2014 to 2016 has continuously grown up to 860 MSm3.

2. Infrastrukturstandard (Artikel 5)

viii) Falls mit den zuständigen Behörden der betreffenden Risikogruppen(n) oder mit direkt verbundenen Mitgliedstaaten vereinbart, gemeinsame Berechnung(en) des N – 1-Formel:
— Berechnung der N – 1-Formel gemäß Anhang II Nummer 5,
— Beschreibung der Werte, die für alle Elemente in der N – 1 Formel verwendet werden, einschließlich der für ihre Berechnung verwendeten Zwischenwerte (falls diese von den unter Nummer 2 Buchstabe a Unternummer iii beschriebenen Werten abweichen),
— Angabe der für die Berechnung der Parameter in der N – 1 Formel (z. B. Dmax) zugrunde gelegten Methodologien und etwaigen Annahmen (Verwendung von Anhängen zwecks ausführlicher Erläuterungen)
— Erläuterung der Vereinbarungen, die getroffen wurden, um die Einhaltung der N – 1-Formel sicherzustellen;

N-1 formula calculation

As provided for by article 5. 3 of the Regulation, the competent authorities of relevant Member States may agree to provide the calculation of the N – 1 formula at regional level in the common risk assessment (art. 7), following the provisions of point 5 of Annex II of the Regulation.

The N – 1 formula describes the ability of the technical capacity of the gas infrastructures to satisfy total gas demand in the calculated area in the event of disruption of the single largest gas infrastructure during a day of exceptionally high gas demand occurring with a statistical probability of once in 20 years (Dmax).

For this extent Member States have provided their national Dmax as follow:

[MSm³/d]	D_{max} 2018/2019	D_{max} 2020/2021
Austria	*55,3*	*55,3*
Croatia	*16,6*	*16,6*
Italy	*443,0*	*438,0*
Malta[2]	*N.A.*	*N.A.*
Slovenia	*4,9*	*6,1*

[2] This is based on the assumption that Malta is currently not connected through a gas pipeline interconnection and that the current gas demand for power generation is supplied by LNG from a floating storage unit, which acts as an intermediate solution. This is not taken into consideration in Section 2 of the Libyan Common Risk Assessment.

As provided for by Annex II of the Regulation, for the calculation of the "N – 1 formula at regional level", the single largest gas infrastructure of common interest shall be used; the single largest gas infrastructure of common interest for the North Africa gas supply risk group Libya is Baumgarten hub, the receiving point of Russian gas supply coming from Ukrainian route.

The formula used for the calculation of the "N – 1 formula at regional level" is the one provided by the point 4 of Annex II "*Calculation of the N – 1 formula using demand-side measures*":

$$N-1[\%]=\frac{EP_m+P_m+S_m+LNG_m-I_m}{D_{\max}-D_{eff}}\times 100, N-1\geq 100\%$$

The parameters of the formula have been calculated as follows:

EP_m	*Import capacity available in the time period considered. This means the capacity that is technically available when the demand D_{max} occurs.*
P_m	*Maximum technical production capacity.*
S_m	*Maximum technical deliverability of storage defined as the sum of the maximum daily withdrawal capacity of all the storage facilities that can be delivered to the entry points of the national network, taking into account their respective physical characteristics. As specified in the Regulation, the maximum capacity used in the calculation is evaluated considering all storages at the 100% and 30% of their working volumes.*
LNG_m	*Maximum technical capacity of the LNG plants, i.e., the maximum daily send-out of the facilities connected to the national network, taking into account the critical elements like unloading, ancillary services, temporary storage, regasification of LNG and the interconnection capacity with the transport network.*
I_m	*Maximum technical capacity of the major entry point.*
D_{max}	*The demand of the entire group, determined by considering the forecast of market consumption in exceptional weather conditions evaluated with the probability of occurrence of once every 20 years.*
D_{eff}	*The portion of the demand that, in case the supply is interrupted, can be adequately and promptly covered using market-based demand measures.*

Tables below are calculated taking into account the following interruptions:

- Baumgarten as the single larger infrastructure (Im) as requested by the SOS regulation
- Gela

As provided by the Regulation, the N-1 formula has been computed taking into account the 100% of underground storage working gas volume and also taking into account the 30% of the same value. The index has been calculated taking into account a 2018/2019 scenario a sensitivity calculation has been carried out with 35 MSm3/day entry capacity at Passo Gries entry point (Fluxys SA, controller of TENP pipeline, disposed the unavailability, for surveys and inspections, of 60% of the same transport infrastructure capacity at least until March 2019 the resulting maximum import capacity is 35 MSm3/day).

For each scenario the index results far above the 100%, with the exception of the most challenging of the considered situations (GY 2018/2019, TENP reduced capacity + Baumgarten disruption + storage level at 30%) that delivers a result slightly below the required standard. This result means that regional gas infrastructures are barely sufficient in order to cover maximum demand of the involved Member States.

However, N-1 index does not take into account possible existence of internal bottlenecks or problems induced by malfunctioning of internal interconnection points or due to lack of available capacity to attract gas. All these risks are evaluated in the following risk analysis.

The following tables summarise the data set used for N-1 formula calculation.

Table 1: Data 2018/2019 [MSm3/d]

Disruption (I_m)	Capacity
Baumgarten [4]	***148,1***
Gela	***49,2***

[4] The limiting factor is the exit capacity on the Slovak side which is lower than entry capacity on the Austrian side.

Member State	Ep_m	LNG_m	S 100%	S 30%	P_m	D_{max}
Austria	172,2	-	66,4	44,4	3,4	55,3
Croatia	7,2	-	5,8	3,2	3,5	16,6
Italy	198,0	51,9	263,2	171,8	15,5	443,0
Slovenia	-	-	-	-	-	4,9
TOT	***377,4***	***51,9***	***330,8***	***205,8***	***22,4***	***519,8***

Table 2: 2018/2019 N-1 index values

		N-1 index	N-1 index (TENP reduction)
Baumgarten	**UGS 100%**	*122%*	*116%*
	UGS 30%	*0,98%*	*92%*
Gela	**UGS 100%**	*141%*	*135%*
	UGS 30%	*117%*	*11%*

Table 3: 2020/2021 Data [MSm3/d]

Disruption (I_m)	**Capacity**
Baumgarten	***148,1***
Gela	***49,2***

Member State	**Ep_m**	**LNG_m**	**S 100%**	**S 30%**	**P_m**	**D_{max}**
Austria	172,1	-	66,4	44,4	3,4	55,3
Croatia	7,2	-	5,8	3,2	3,5	16,6
Italy	198,0	51,9	291,3	190,8	18,9	438,0
Slovenia	-	-	-	-	-	6,1
TOT	***377,3***	***51,9***	***363,4***	***238,3***	***25,8***	***516,0***

Table 4: 2020/2021 N-1 index values

		N-1 index	N-1 index (TENP reduction)
Baumgarten	**UGS 100%**	130%	124%
	UGS 30%	106%	100%
Gela	**UGS 100%**	149%	143%
	UGS 30%	125%	119%

Disruption (I_m)	Capacity
Baumgarten	***148,1***[1]
Gela	***49,2***

[1]The limiting factor is the exit capacity on the Slovak side which is lower than entry capacity on the Austrian side.