

Revised SoS Regulation: ReCo System For Gas and Simulation of Disruption Scenarios

EnC Security of Supply Coordination Group

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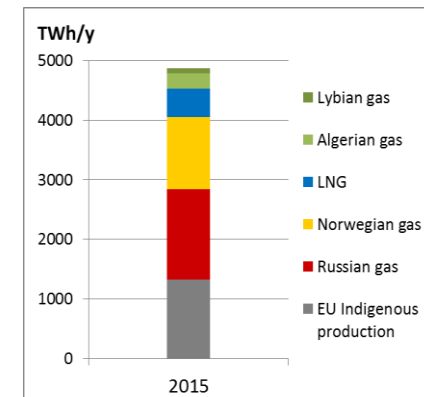
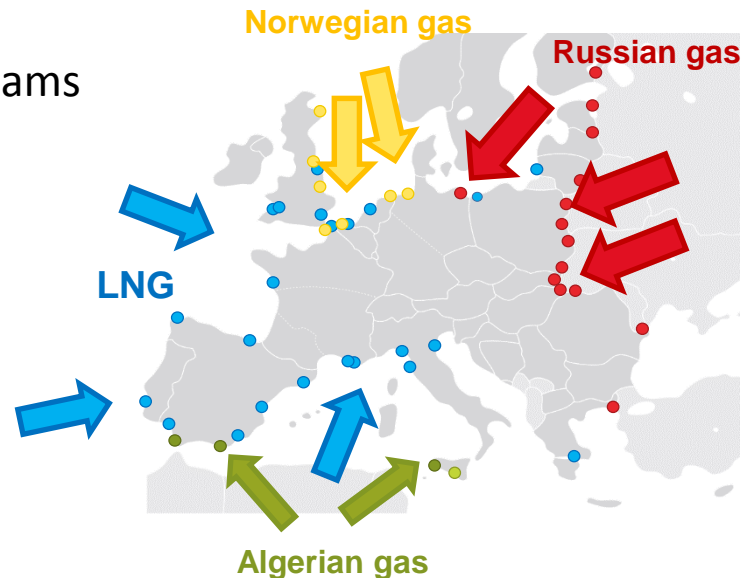
Revised SoS Regulation and RCSG

Article 3 **Responsibility for security of gas supply**

5a. In the event of a regional or Union emergency crisis, the transmission system operators shall cooperate and exchange information using the Regional Coordination System for Gas (ReCo System for Gas) where already established by ENTSOG . ENTSOG will inform the Commission and the competent authorities of the Member States concerned.

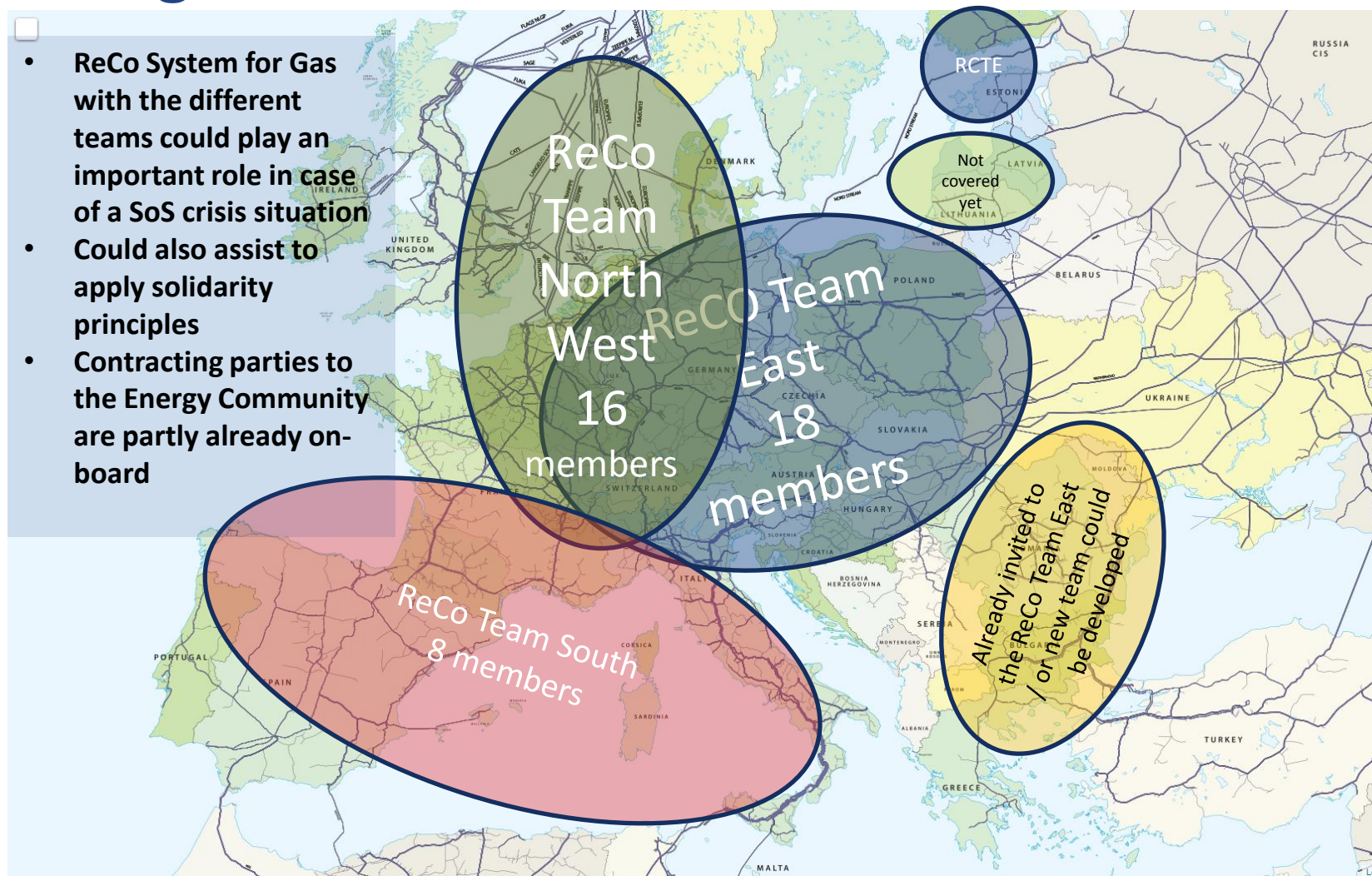
Regional Coordination (ReCo) System for Gas – Main objectives

- **A broader vision of all gas flows entering the EU MS**
 - > European TSOs and EU aim to
 - enhance the level of **Security of Supply in crisis situations**
 - provide an **overview of the main gas supply flows**
- **Bridging the gap of non-existing international cooperation in a crisis situation**
 - > Install Regional Coordination Teams
 - > Provide toolboxes



Regional Coordination Teams

- ReCo System for Gas with the different teams could play an important role in case of a SoS crisis situation
- Could also assist to apply solidarity principles
- Contracting parties to the Energy Community are partly already on-board



30 TSOs are already involved in the ReCo Teams



Regional Coordination Teams Communities of TSOs

Aim

- avoid, prevent or mitigate negative impact of gas disruption in appropriate region in case of any technical or whatever reason
- to be well prepared to any possible crisis or negative situation

ReCo teams are the Tool

- Fast and reliable informing TSOs which could be impacted about possible negative event
- Joint cooperation between TSOs, listening each other and looking for the mutual and regional solutions

Result

Wide view and detail information about possible negative situation
Final mutual and regional decision which takes into account arguments and positions of all participating TSOs



Reginal Coordination Teams



Members

- Free for all TSOs which are a part of the chain of the appropriate gas flow route

Facilitator

- To establish the meeting in case of need
- Annual rolling basis
- Communication exercise

Coordinator

- The coordinator is chairing the ReCo Team whenever it comes together.
- Acts as the spokesman of the ReCo Team in order to provide first-hand information.
- By default this role will be allocated to the TSO initially calling the facilitator.

ENTSOG

- Organizes meeting explanations, presentations, ToRs, change of facilitator
- Provides WebEx tool for communication

Responsibility

- All TSOs taking part in the ReCo teams are acting in their own responsibility. They can't be forced to carry out any specific action. All agreed upon solutions and actions are executed on a voluntary basis only.



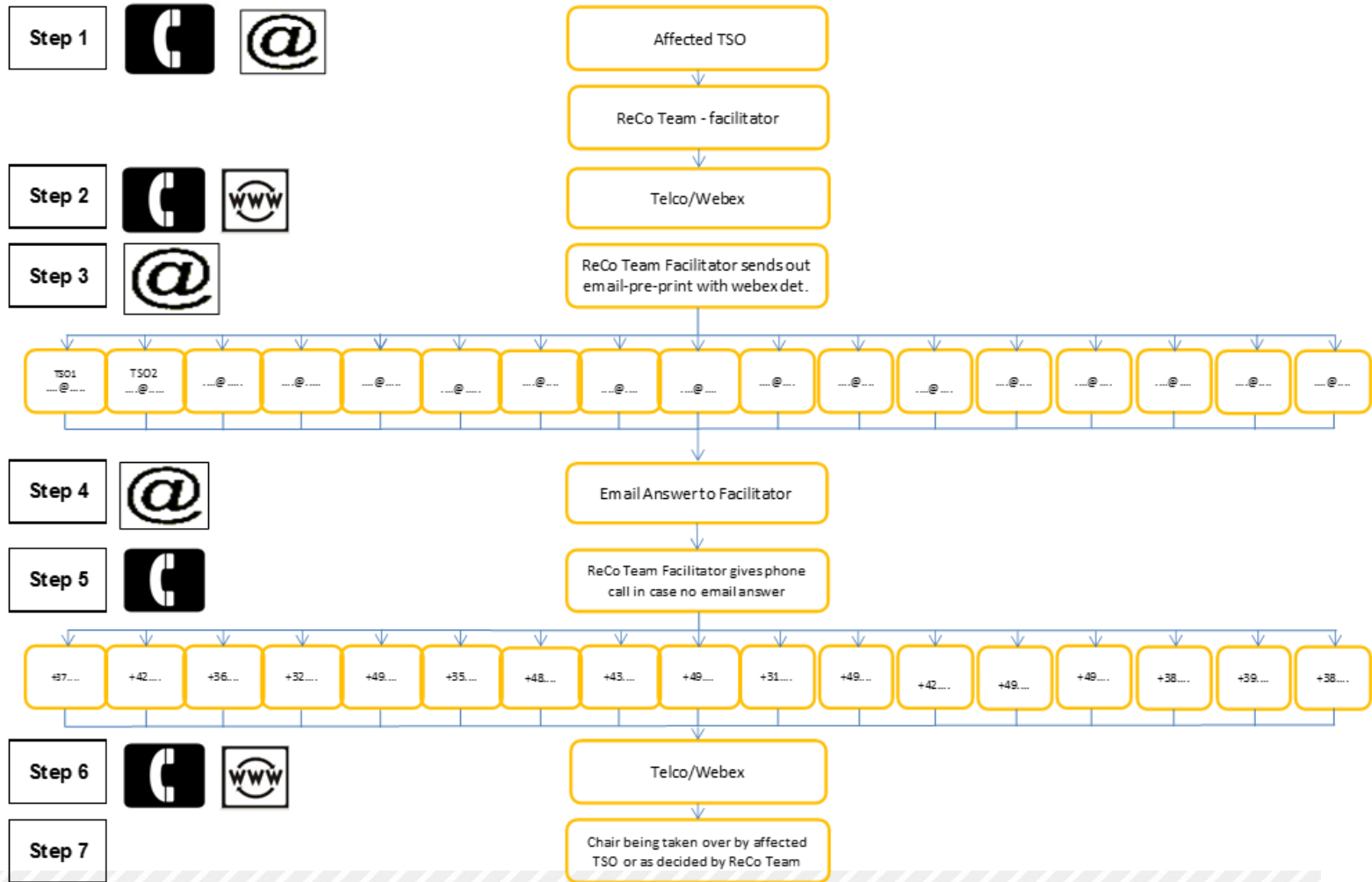
ReCo System for Gas. Functioning



- **Guidance**
- **Email pre-print**
- **Facilitator for each ReCo Team**
 - Fixed telephone number
 - 24/7 reachability
 - Getting the ReCo teams members together in short notice
 - Virtual room via webex
 - Discussing possible short term solutions
- **Toolbox**
 - Swaps
 - Re-directing of gas
 - Extra capacity
 - Operational Map
 - Etc.
- **Coordinator for each ReCo Team**
 - Coordinating the Team
 - Spokesman of the Team



ReCo System for Gas – Communication Flowchart





Revised SoS Regulation – Simulations

ENTSOG's role in Revised SoS Regulation

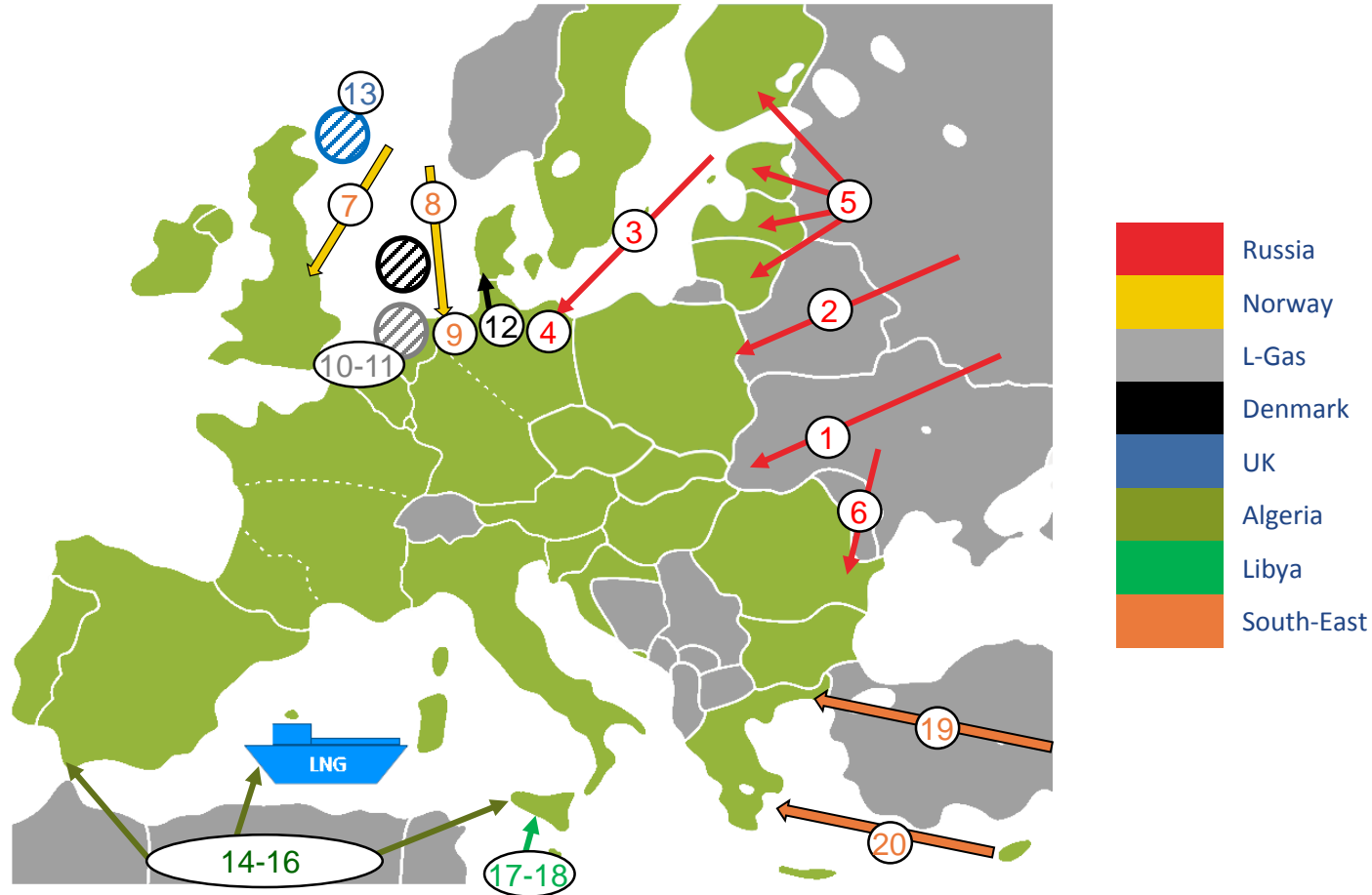


Extract of Article 6
(revision from 5 May 2017)

By 1 November 2017 ENTSOG shall carry out a Union wide simulation of supply and infrastructure disruption scenarios including the identification and assessment of Emergency Supply Corridors. The simulation shall also identify which Member States can provide a solution to address identified risks, including in relation to LNG. The scenarios and the methodology shall be defined by ENTSOG in cooperation with the GCG. ENTSOG shall ensure an appropriate level of transparency and access to its modelling assumptions used in its scenarios. The Union-wide simulation of supply and infrastructure disruption scenarios shall be updated every four years unless circumstances warrant intermediary updates.

Disruption scenarios

> Supply and infrastructure disruptions scenarios



> Based on the existing infrastructure

General Assumptions



1. Disruption duration

- 2 months for offshore infrastructures
- 2 weeks for onshore infrastructures
- 2 months for other disruptions

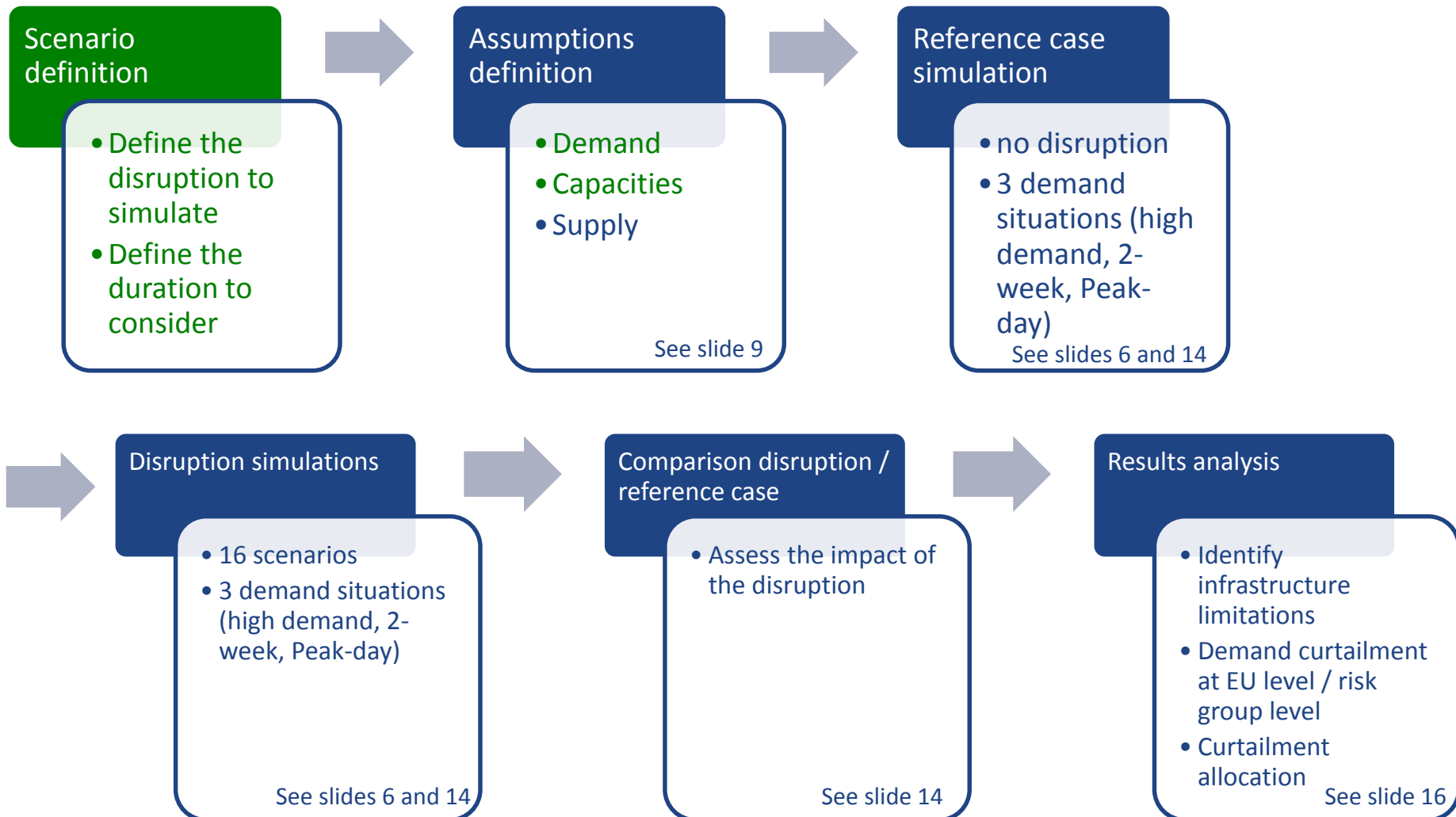
2. Gas demand assumptions

- Highest winter demand since 2009/2010
- Highest winter demand + 2-week cold spell in 20 years
- Highest winter demand + Peak-Day in 20 years

3. Infrastructure assumptions

- Existing infrastructure with capacities as of today (1 Oct. 2017)

Simulation methodology





Modelling principles

ENTSOG simulate a whole winter from 1 October to 31 March

Disruptions scenarios

Supply and infrastructure disruption

Infrastructure topology – capacities



Modelling tool

**NEMO
TOOL**



Assumptions

Demand
Supply (including storage)

Simulations

Supply levels
Curtailed demand

Analysis

Infrastructure limitations
Curtailement allocation



High demand events

For all scenarios, 3 different assessments proposed by ENTSOG

- > Impact of a high demand winter (whole winter simulation)
- > Impact of a 2-week in 20 years high demand situation during a disruption (2-week cold spell simulation)
- > Impact of a Peak-day in 20 years during a disruption (Peak-day simulation)





High demand events proposal



1. *Whole winter*

- > Reference case: no disruption
- > Onshore technical disruption: 2 weeks from 15 February to 28 February
- > Offshore and non-technical disruption: 2 months in January and February

2-week disruption

15 Feb.

28 Feb.

Oct.

Nov.

Dec.

Jan.

Feb.

Feb.

Mar.

2-month disruption

1 Jan.

1 Mar.

Oct.

Nov.

Dec.

Jan.

Feb.

Mar.

High demand events proposal

2. 2-week cold spell in 20 years

- > For the reference case and all 16 scenarios
- > From 15 February to 28 February*
- > Simulated simultaneously with the disruptions

3. Peak-day in 20 years

- > For the reference case and all 16 scenarios
- > On 15 February*
- > Simulated simultaneously with the disruptions





Supply assumptions proposal

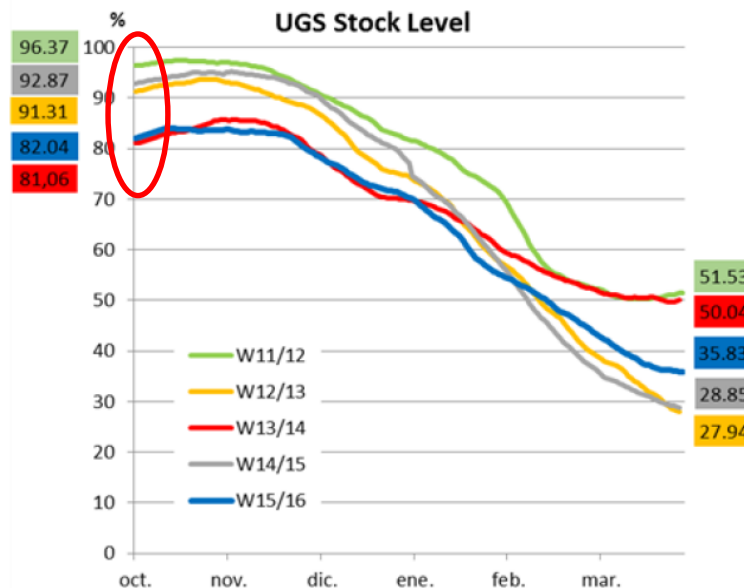


Limitation	Pipeline imports	LNG imports	Indigenous production
Seasonal	highest winter average supply in 5 years		Based on data collection for winter 2017-18 Except for Danish production (complete shut down)
Monthly	highest monthly supply in 5 years		
Weekly	No additional limitation	Week 1: imports similar to normal conditions + flexibility ensured by LNG tanks Week 2: imports can increase up to the maximum potential + use of remaining LNG tanks capacities	
Daily	highest daily supply in 5 years	maximum send-out capacity	



Supply assumptions proposal – storage levels

- > Working Gas Volume: from GIE/AGSI transparency platform in 2017
- > Initial levels to start the simulation:
 - historical low for the last 5 years on 1 October.
- > The modelling considers possible injection during early winter if demand and supply configuration allows for it



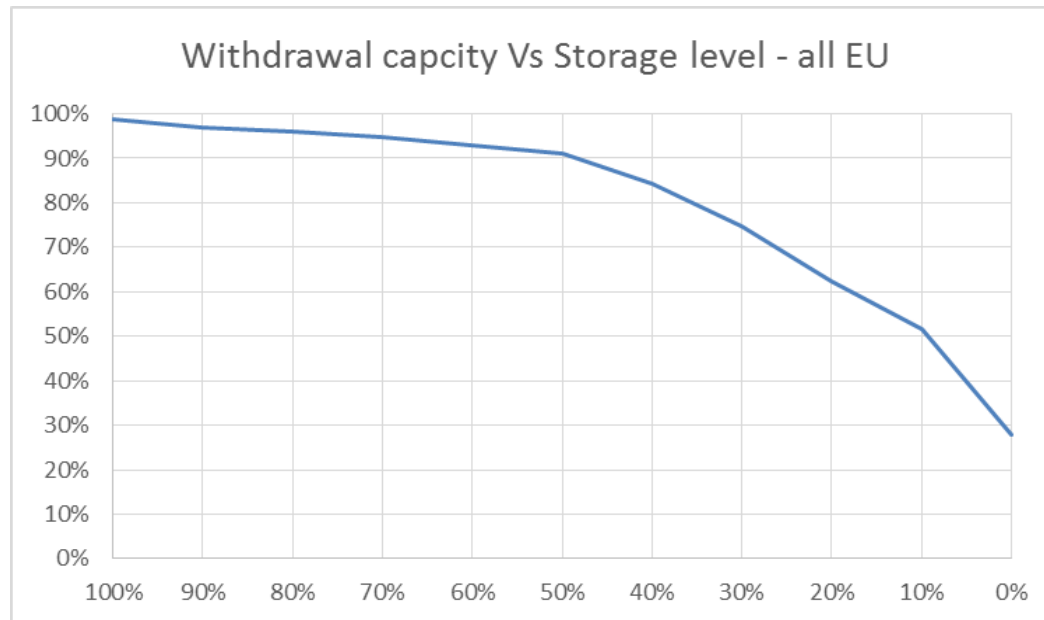
Historical stock level during winter for all EU
Source: ENTSOG Winter Review 2015-2016



Supply assumptions proposal

Storage withdrawal capacities

- > The influence of UGS inventory level on the withdrawal capacity is modelled with deliverability curves provided by GSE.
- > These curves represent a weighted average of the facilities (salt caverns, aquifers or depleted fields) of each country.



Evolution of withdrawal capacities with storage levels
- EU average -

Exports assumptions proposal

- > Exports to Ukraine, Kaliningrad and Turkey based on 5 years history
- > Exports to Turkey set at 0 in case of Ukraine route disruption
- > Exports to Kaliningrad set at 0 in case of Belarus and Baltic states route disruption



Imports specificities

Algerian supply disruption proposal

- > Pipeline and LNG routes disrupted
- > Divided in 2 periods based on feedback from France and Spain after GCG meeting of 22 March
 - 1st period (0 to 3 weeks): send-out capacity of terminals receiving Algerian LNG are reduced by the share of Algerian LNG in their mix (based on public information)
 - 2nd period (3 weeks to 2 months): Algerian LNG imports are assumed replaced by other LNG supplies and no extra limitation is considered



First period (3 weeks)



Second period (after 3 weeks)

Belgium	0%
Finland	0%
France	67%
Greece	100%
Italy	3%
Lithuania	0%
Netherlands	0%
Poland	0%
Portugal	12%
Spain	21%
Sweden	0%
UK	2%

Share of Algerian LNG in the LNG mix per country in 2016
Source: GIIGNL

Proposed methodology

1. Reference case definition (no disruption)



Reference case

- > 3 simulations (whole winter + 2-week during high demand winter + Peak-day during high demand winter)
- > No disruption
- > Existing infrastructure
- > Demand assumptions: in accordance with GCG outcomes
- > Supply assumptions: in accordance with GCG outcomes

This case is a reference when assessing the resilience of the infrastructure against the different disruption scenarios.

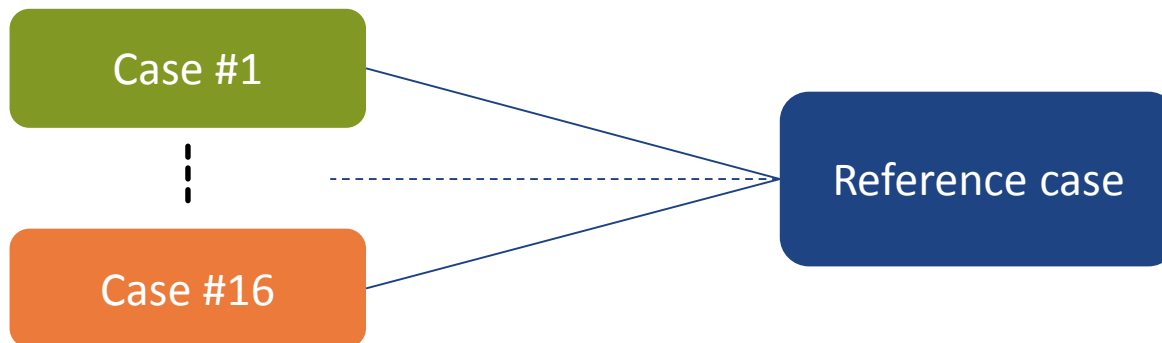
Proposed methodology

2. Scenarios simulations (#1 to #16)



> All parameters similar to the reference case except for the disrupted supply / infrastructure

3. Comparison of the outcomes of each scenario to the reference case





Thank You for Your Attention

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