entsog

european network
of transmission system operators
for gas

Cologne 13 September 2016

Outcome of CEN standard consultation

Gas Quality KG

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Image Courtesy of Thyssengas

Agenda

1. Welcome and introduction
2. Gas Quality provisions in the INT NC
3. Outcome of the public consultation
4. Way forward for the INT NC amendment

Introduction

Background

1. Letter from EC to ENTSOG (December 2015)

> EC foresees making the CEN standard binding by including it in the INT NC

> EC invites ENTSOG to:

- Prepare a detailed analysis of the gas value chain on the impacts and issues
- Submit to ACER a proposal to amend the NC by 30 June 2017

> Implementation timing and scope as substantive elements

> A broad involvement of stakeholders is crucial

2. Response from ENTSOG to EC (February 2016)

3. First prime mover meeting (March 2016)

4. Workshop in Cologne (April 2016)

5. Public consultation (April – July 2016)

> Barriers, scenarios and impacts

Purpose of Today's Workshop

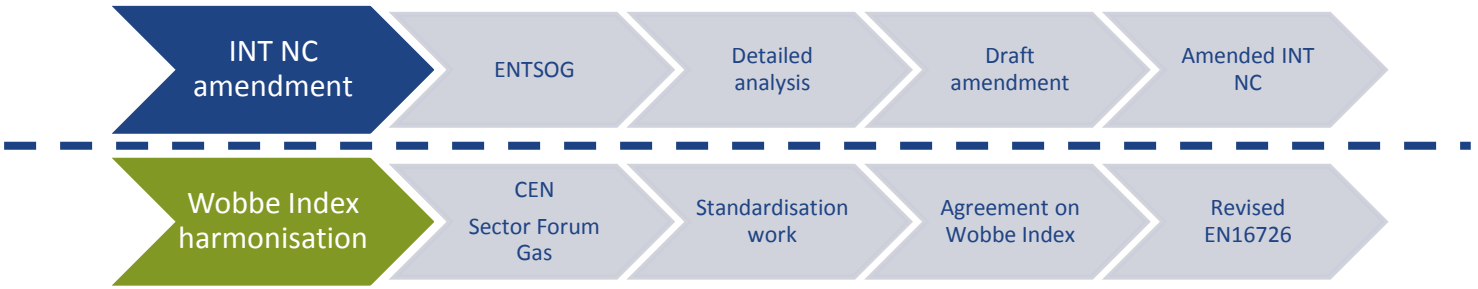
Present a summary of stakeholders' responses to the consultation questions (detailed feedback available at ENTSOG's website)

Provide opportunity for stakeholders to comment on the outcome

Share ENTSOG's thoughts on refined scenarios and a second consultation

Discuss ENTSOG's proposed next steps in this process

Parallel processes of ENTSOG and CEN



- The INT NC amendment process is related to CEN EN16726:2015 standard, which does not include Wobbe Index
- In parallel EC has invited CEN to carry out complementary standardization work in pursue of an agreement on Wobbe Index
- The two processes run independently, including timeline/schedule
- When CEN process delivers a new version of the standard, it will not become automatically binding, as the reference to the standard in the INT NC is not dynamic

Gas quality provisions in the Interoperability network code

INT NC: Cross-border trade restrictions

Article 15 Managing cross-border trade restrictions* due to gas quality differences

**Restriction is understood as a lack of compliance of the gas with the specs of the receiving country resulting in a reduction of flows at the IP*

1. TSOs shall cooperate to avoid restrictions to trade due to gas quality. Standard operations may include swapping and co-mingling.
2. When a restriction cannot by avoided by TSOs and is recognised by NRAs, TSOs may be required to within 12 months:
    1. Develop options without changing specs (e.g. flow commitments, gas treatment).
    2. Cost benefit analysis with breakdown among parties
    3. Estimate implementation time
    4. Conduct a public consultation
    5. Submit a joint proposal for approval of concerned authorities
3. NRAs shall consult each other with the view to have a coordinated decision based on mutual agreement

If gas quality is identified as a restriction for cross-border trade it's managed locally by the parties involved.

INT NC: Short-term info on gas quality

Article 16: Short-term monitoring on gas quality

1. GCV and WI once per hour on TSOs website for gas entering their networks at interconnection points
2. Link available on ENTSOG Transparency Platform

Article 17: Information provision on short-term gas quality variation

1. TSOs define a list of parties (e.g. direct final customers, SSOs, DSOs) who could be adversely affected by GQ changes.
2. Cooperate with them to assess relevant parameters, information frequency, lead time and method
3. At Interconnection points and other points where GQ is measured
4. No additional equipment. Information provided as best estimate.

Indicative information to allow parties to take account of gas quality variations

INT NC: Long term monitoring of GQ

Article 18: Long-term monitoring on gas quality in transmission system

1. ENTSOG will publish an outlook identifying potential trends and varaibility of GQ parameters
2. Covering at least WI and GCV
3. Different forecasts for different regions
4. Every two years and valid for the next ten
5. Including existing and new sources
6. Based on reference values from previous years
7. The forecast will consist of a range within which the parameter is likely to evolve
8. Consistent and aligned with Ten Year Network development plan
9. Open to stakeholder input

Provide a view on gas quality evolution in different European regions

INT NC: Restrictions linked to odourisation

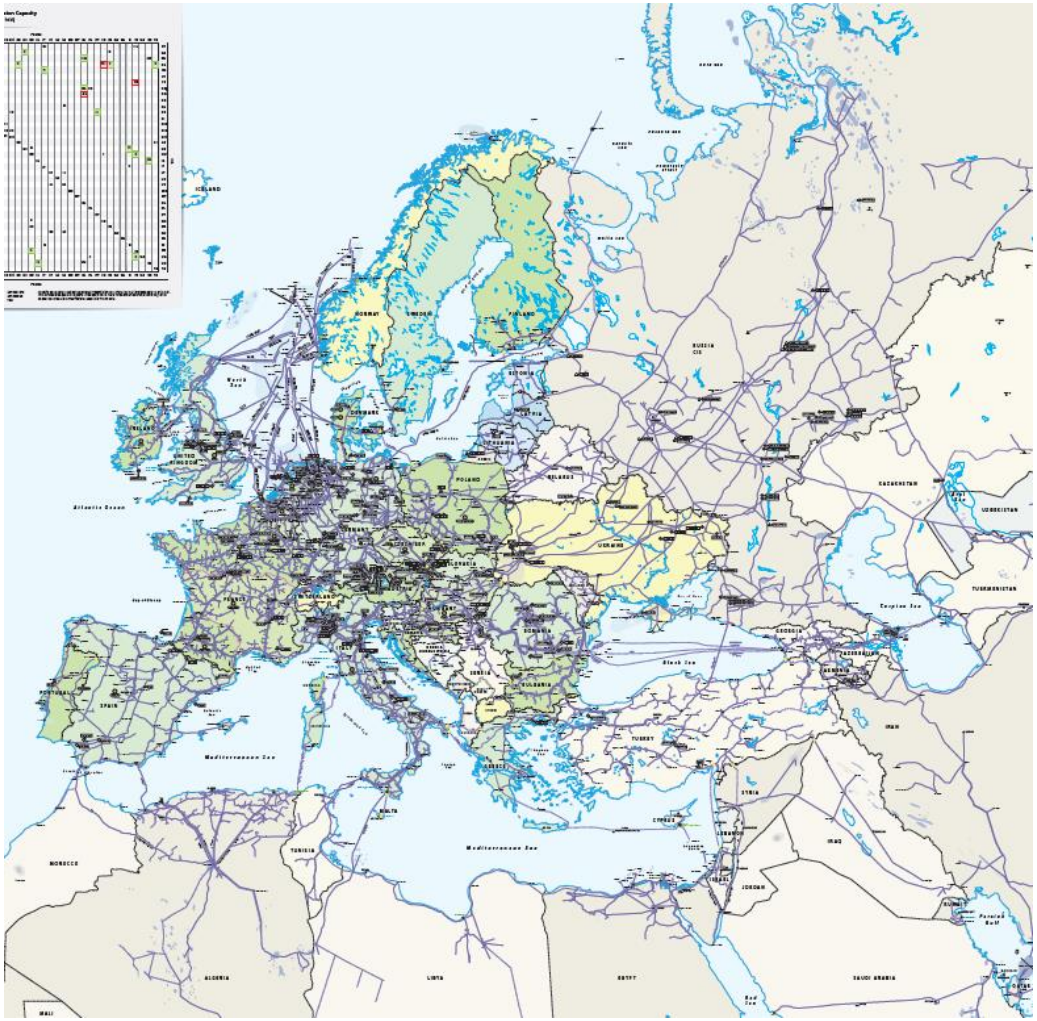
Article 19 Managing cross-border trade restrictions due to differences in odourisation practices

1. When a restriction is a found, TSOs required to reach an agreement (flow commitments, swapping) within 6 months.
2. If no agreement, TSOs develop a plan in 12 months:
    1. Develop options by assessing:
        1. conversion to non-odourised gas
        2. Potential flow of odourised gas
        3. Acceptable level of odourant
    2. Joint cost-benefit analysis (cost breakdown between affected parties)
    3. Estimate implementation time
    4. Public consultation
    5. Submit feasible solutions including cost recovery
3. If solution not proposed or not approved, then conversion to non-odourised flow in four years

If odourisation is identified as a restriction for cross-border trade it's managed locally by the parties involved.

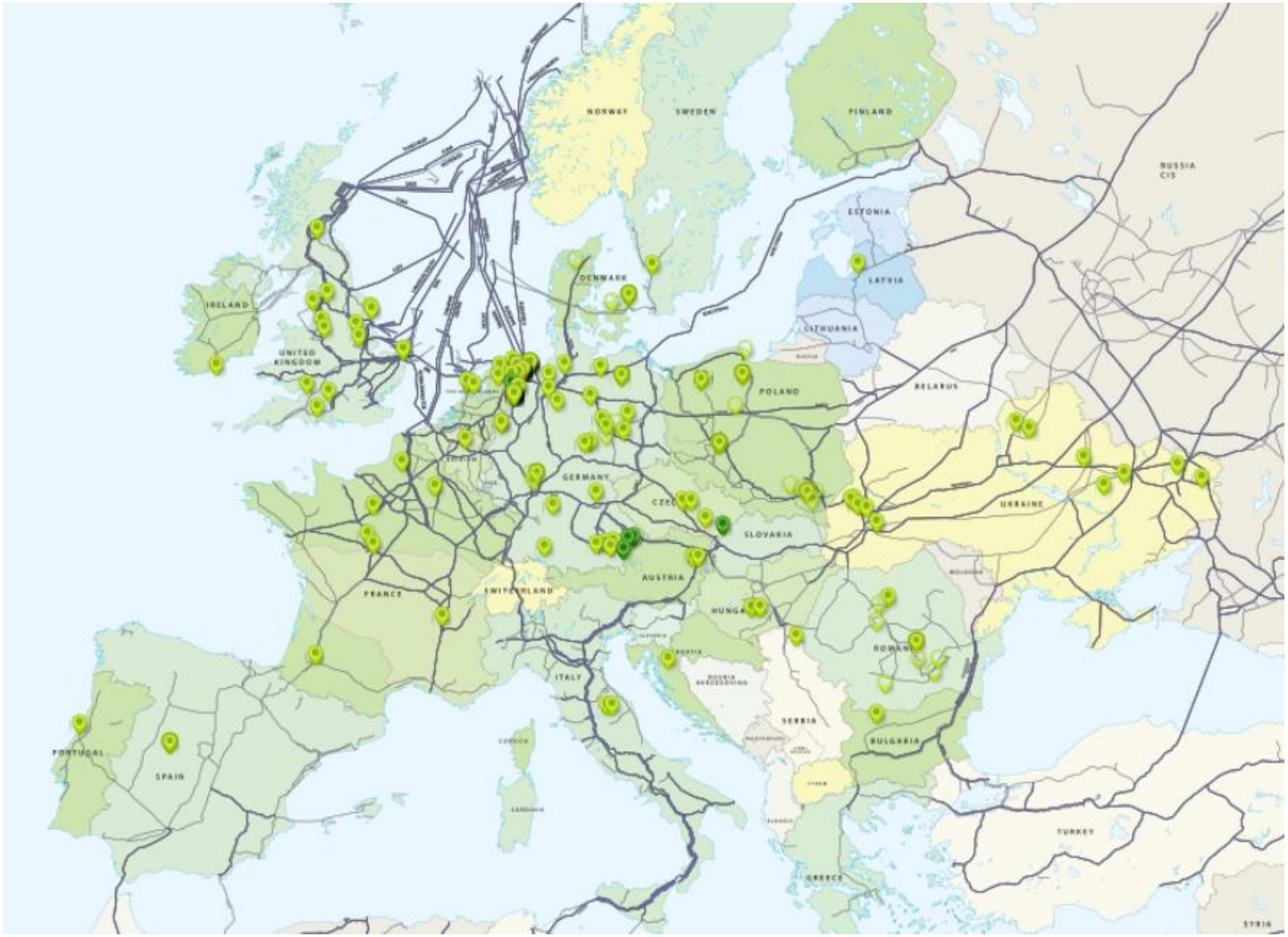
The European gas transmission system

Gas supply in Europe (map ENTSOG/GIE)

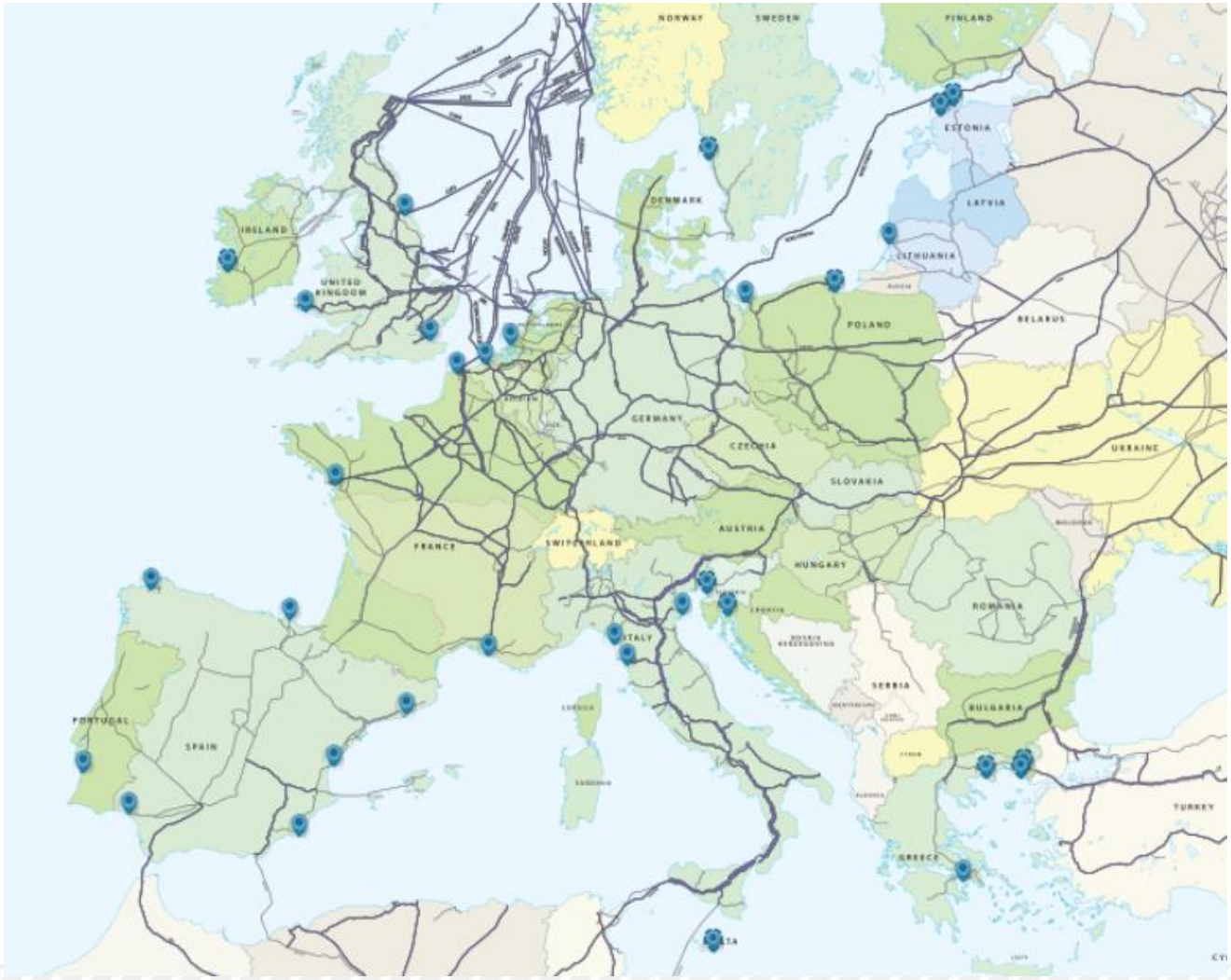


Gas transmission in Europe (>600mm)

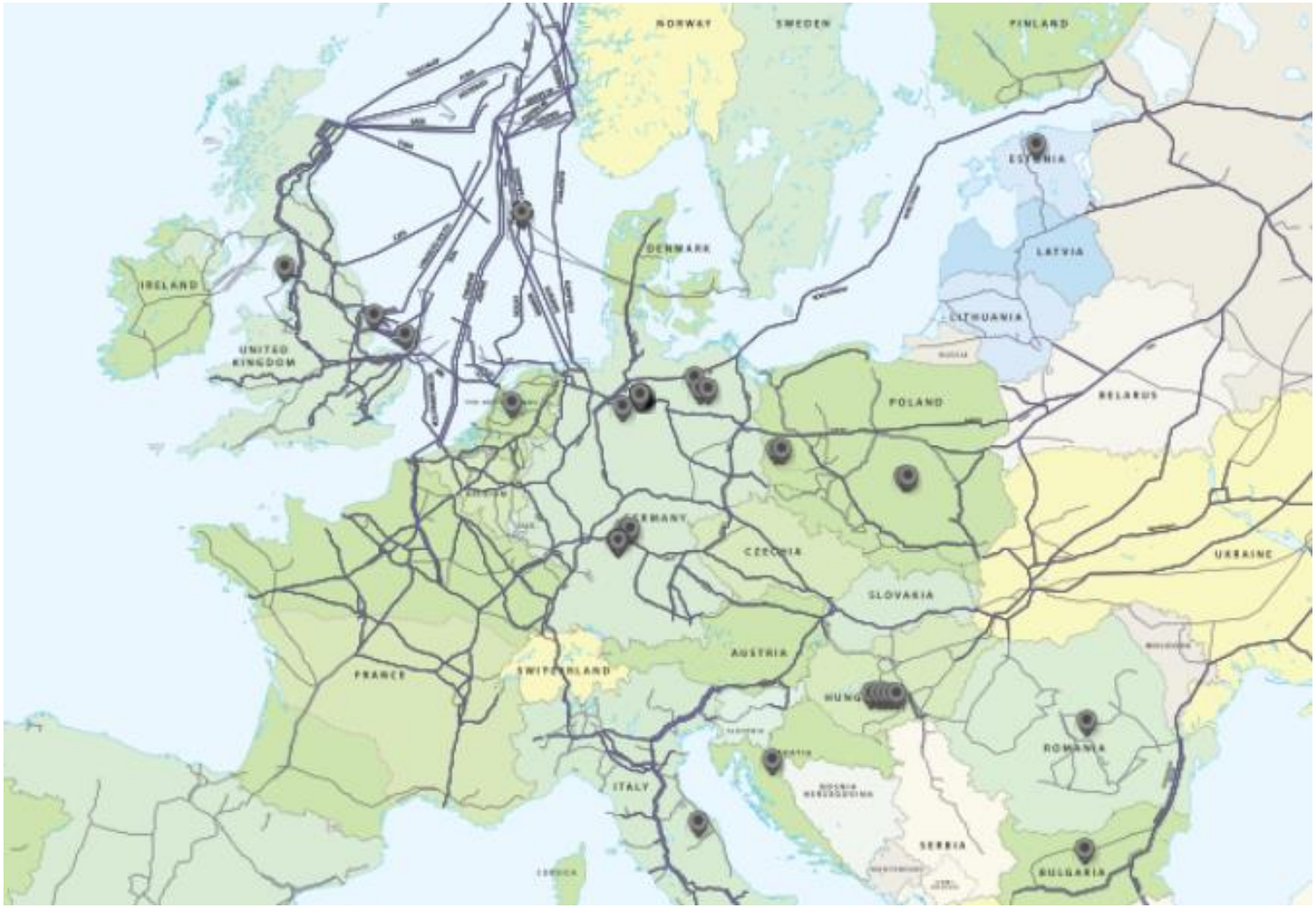
Gas storages in Europe



LNG terminals in Europe



Gas production facilities in Europe

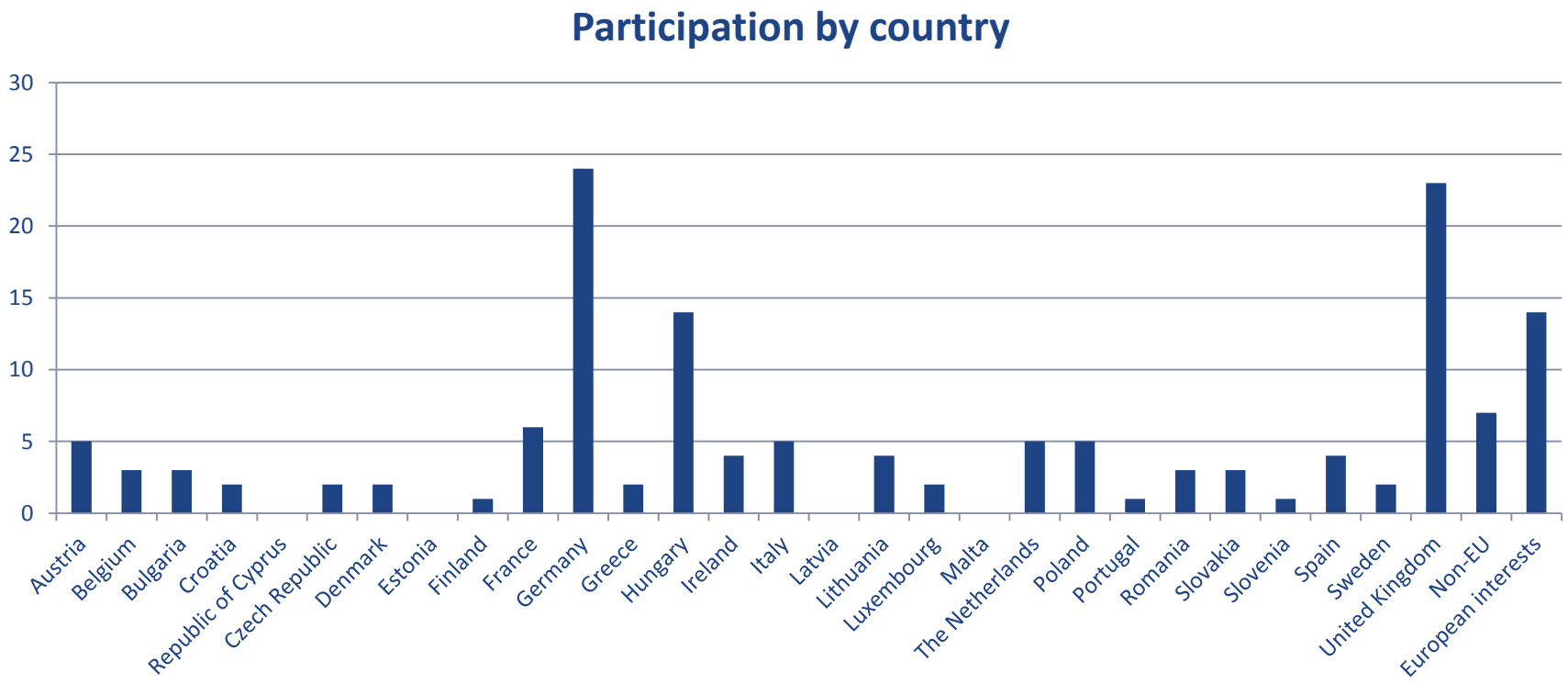


Outcome of the public consultation on CEN standard impacts

Framework of the public consultation

- ENTSOG has been asked to *prepare a detailed analysis - focusing on the entire natural gas value chain in all relevant Member States - on the impacts and issues associated with codifying the standard, including consistency with the provisions already part of Regulation 2015/703*
- ENTSOG invited stakeholders to contribute to the process from the earliest stage by answering to this public consultation
- Results will be a fundamental input to ENTSOG's impact analysis
- The questionnaire for the Public consultation was divided in three different sections:
  - Section 1: general questions
  - Section 2: scenario definition
  - Section 3: impact analysis of scenarios
- Analysis in next slides illustrates the aggregated answers from respondents

Participants

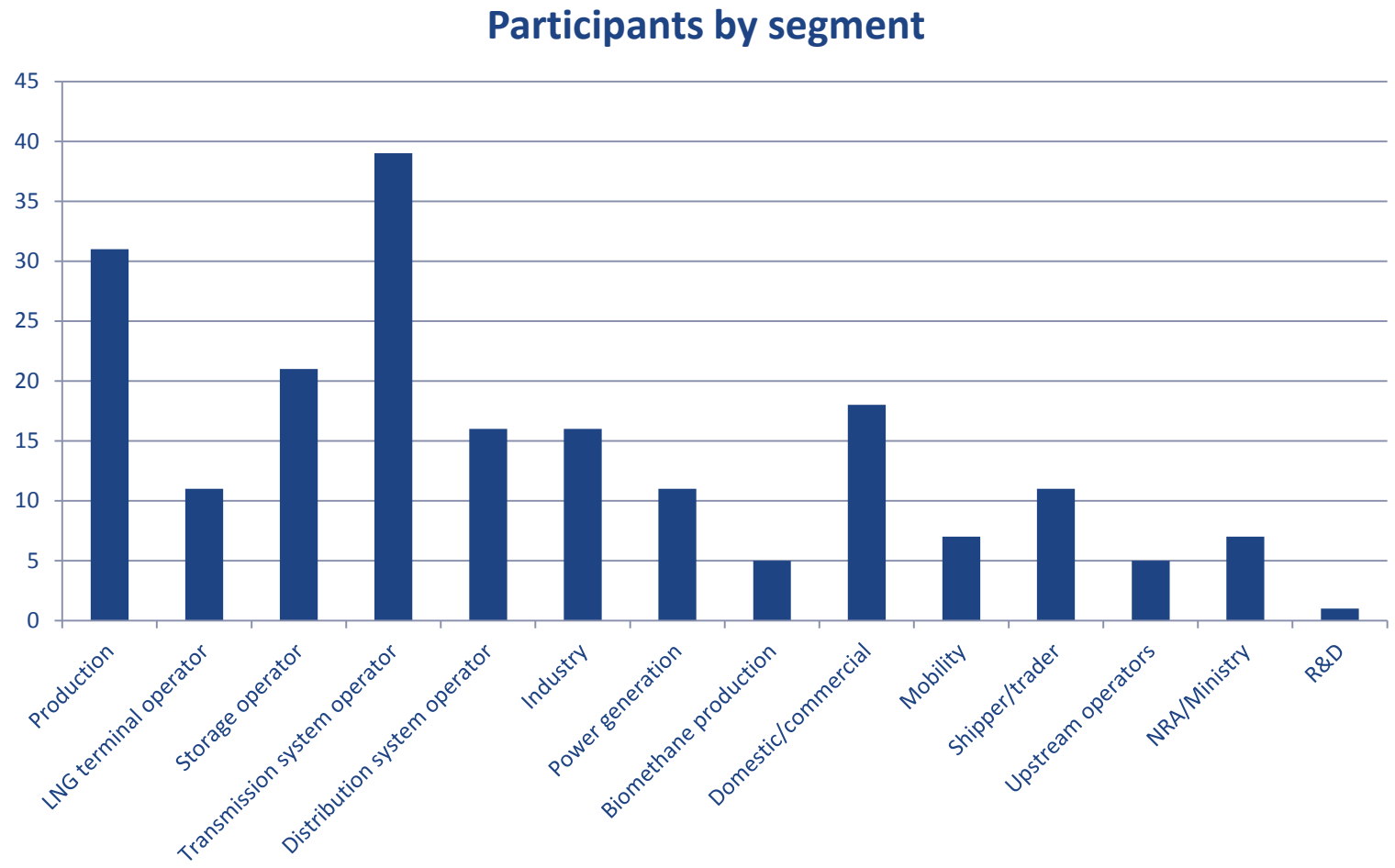


Participation summary

> 111 answers received

> 19 EU member states directly taking part

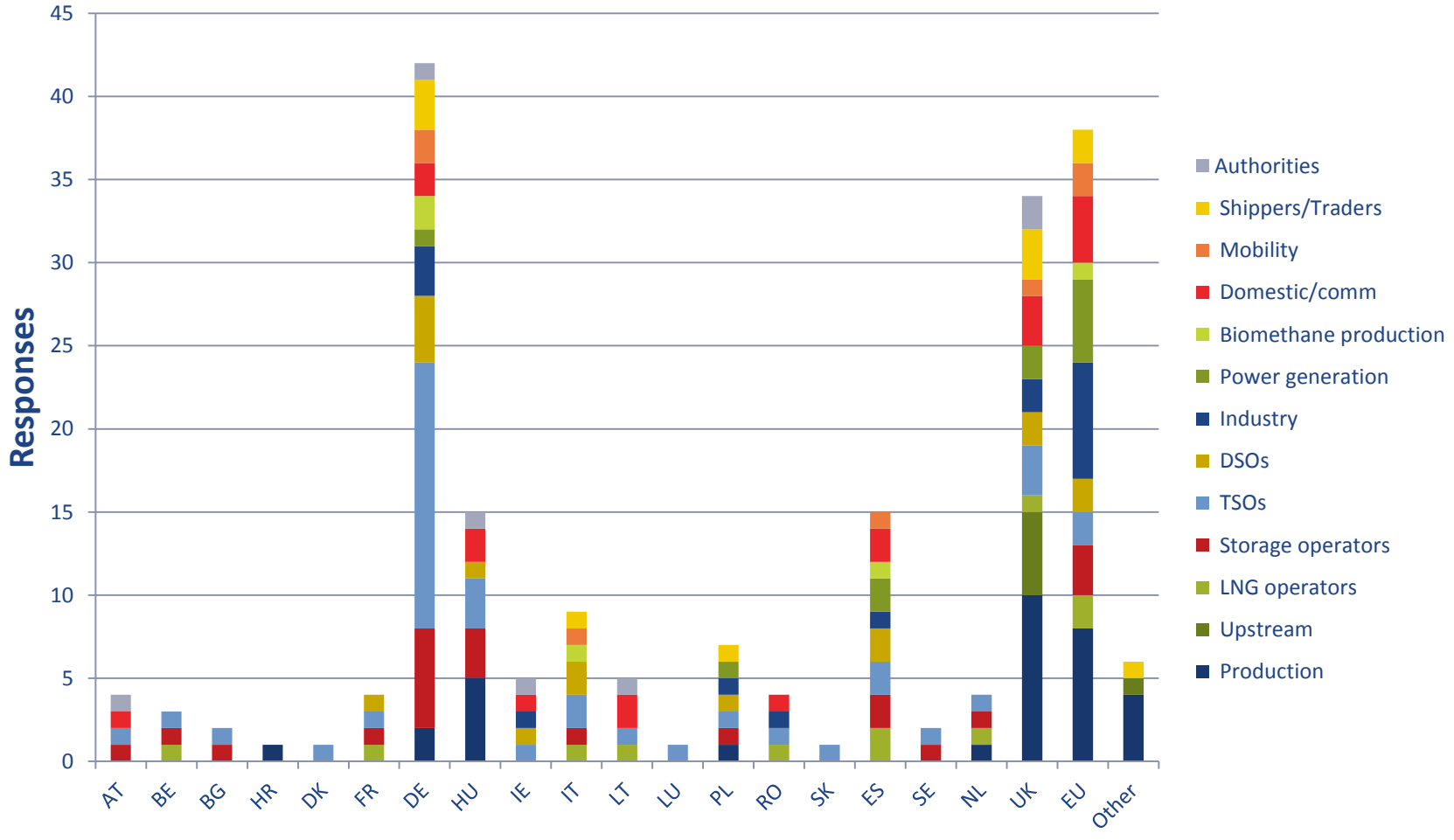
Participants



**It should be noted that some respondents may be included in more than one category*

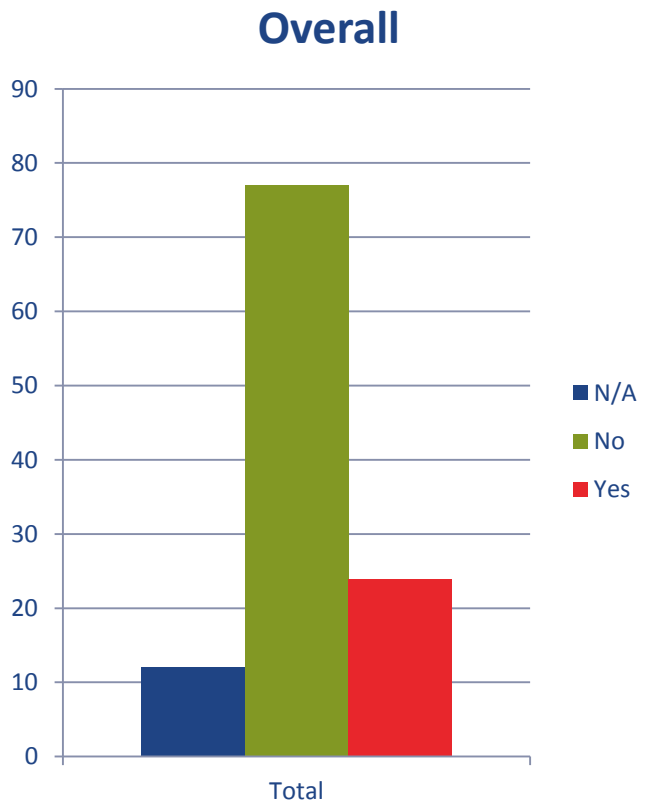
Participants

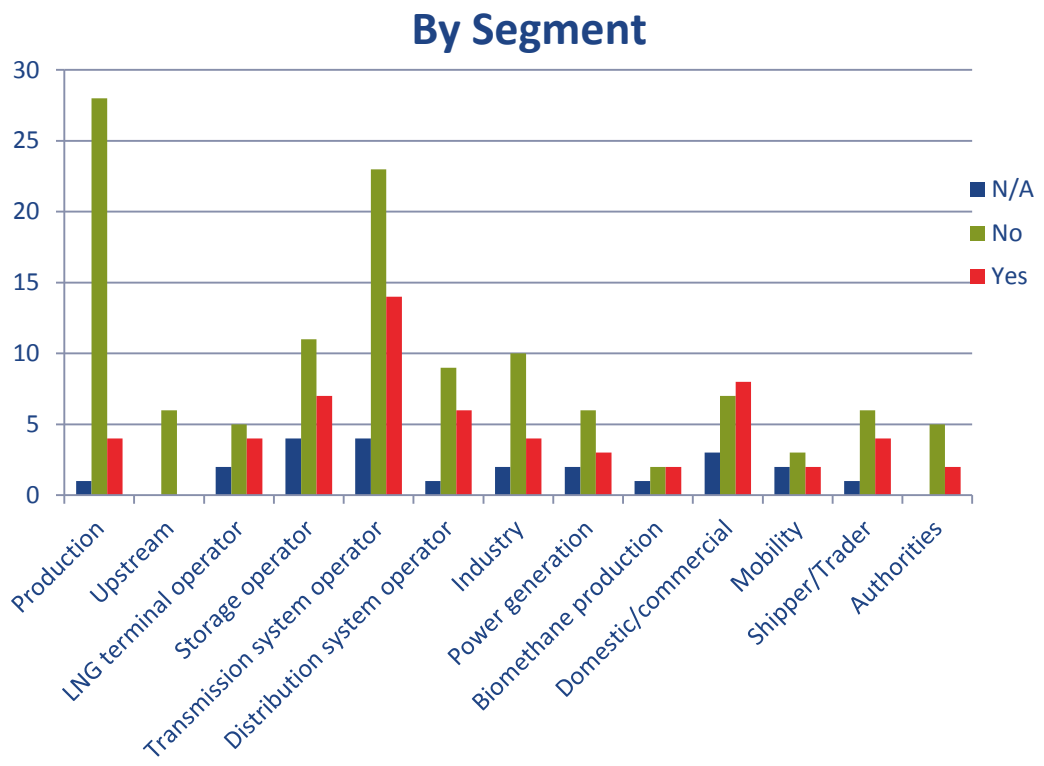
Segment representation per country



Section 1: General Questions

6. Are you aware of any cross-border trade barrier related to gas quality at interconnection points or EU import points?





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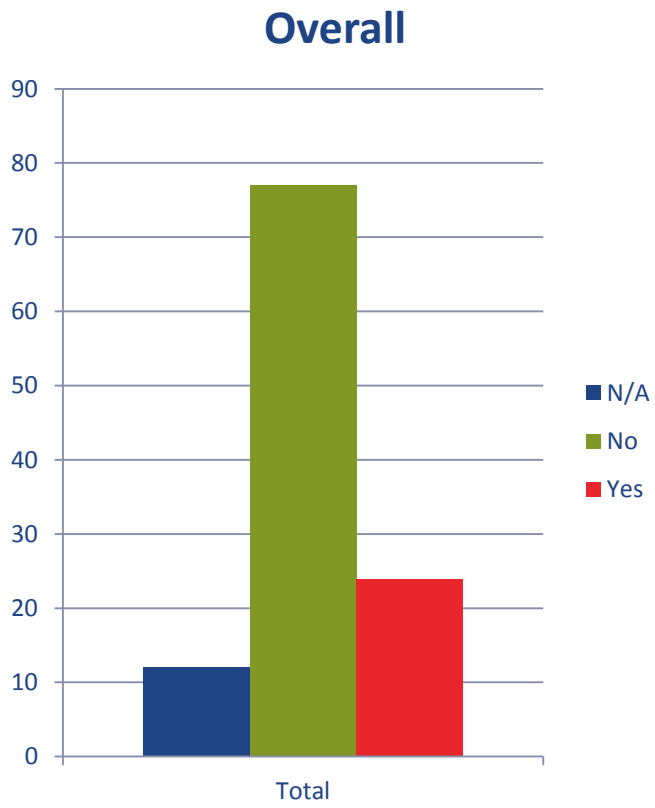

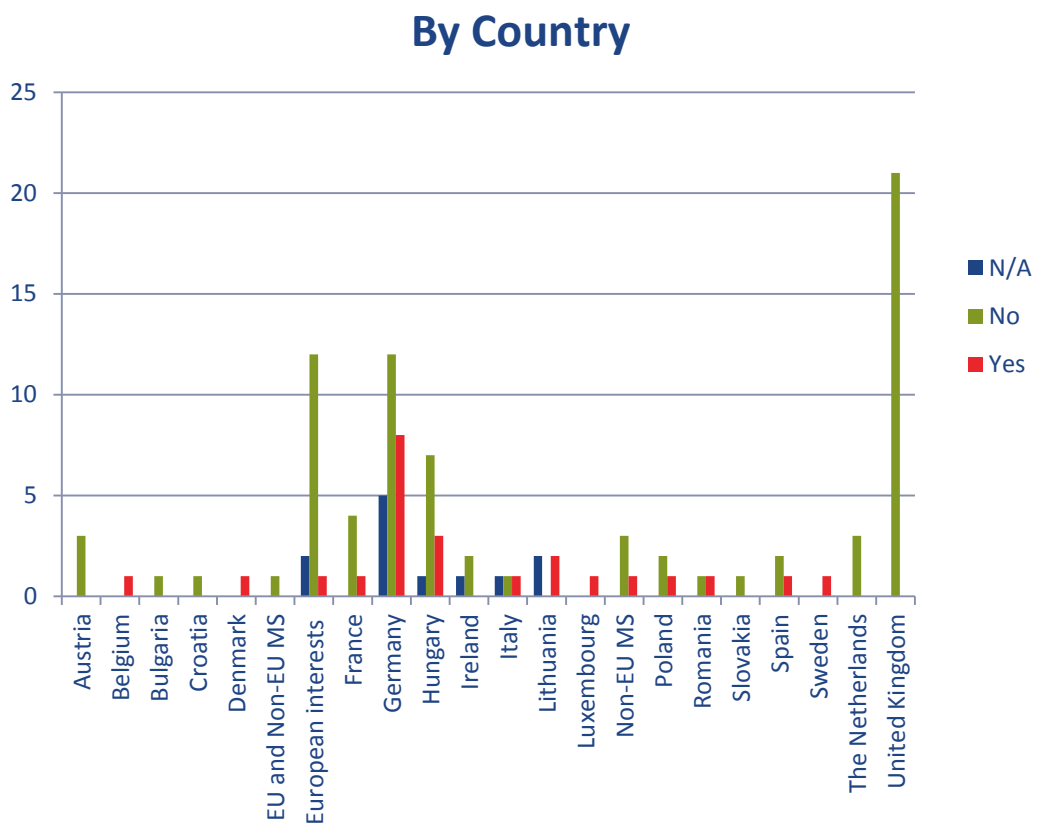

Section 1: General Questions

6. Are you aware of any cross-border trade barrier related to gas quality at interconnection points or EU import points? What parameters are involved?

Comments from those responding 'No'

Section 1: General Questions

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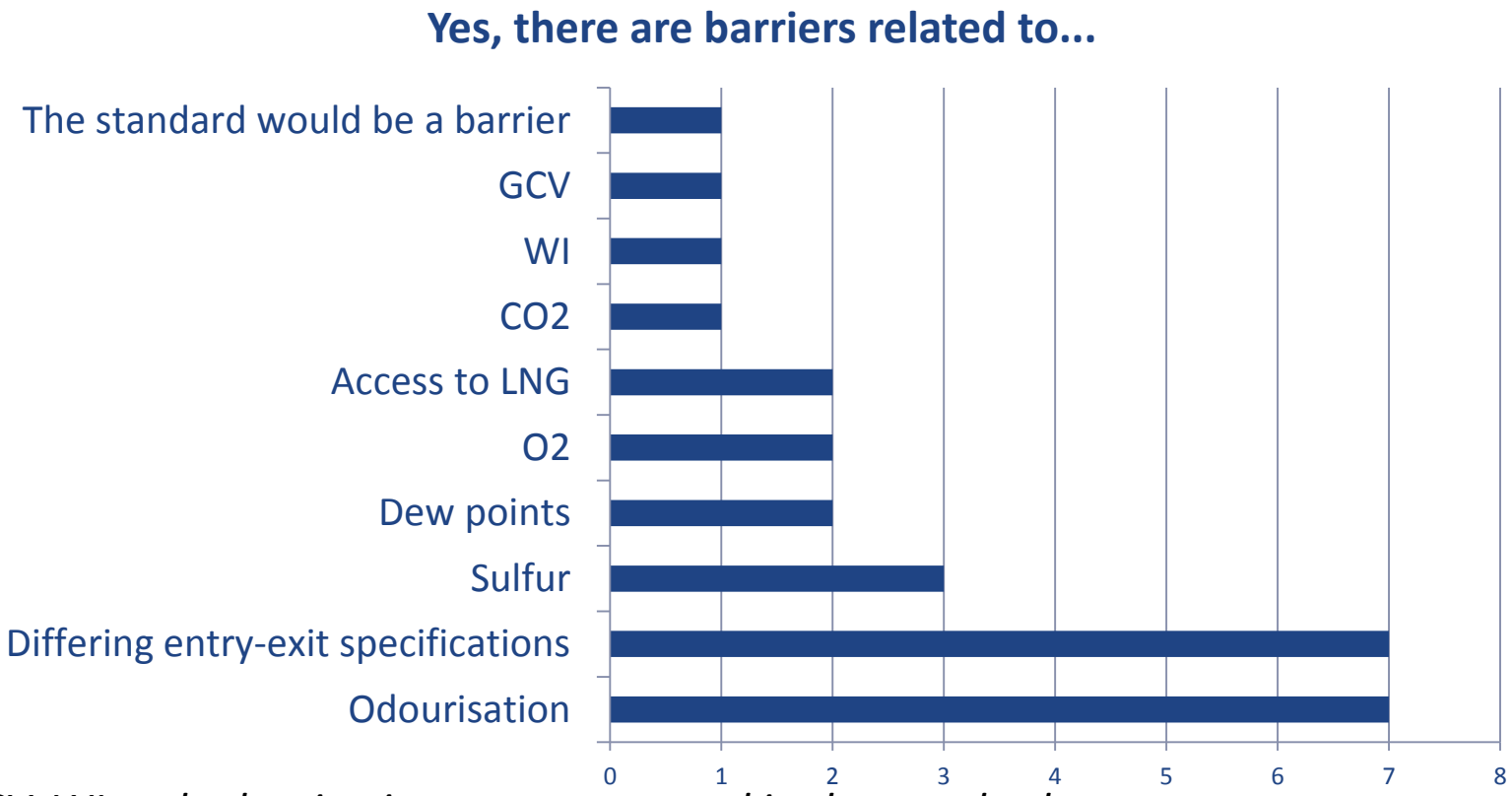
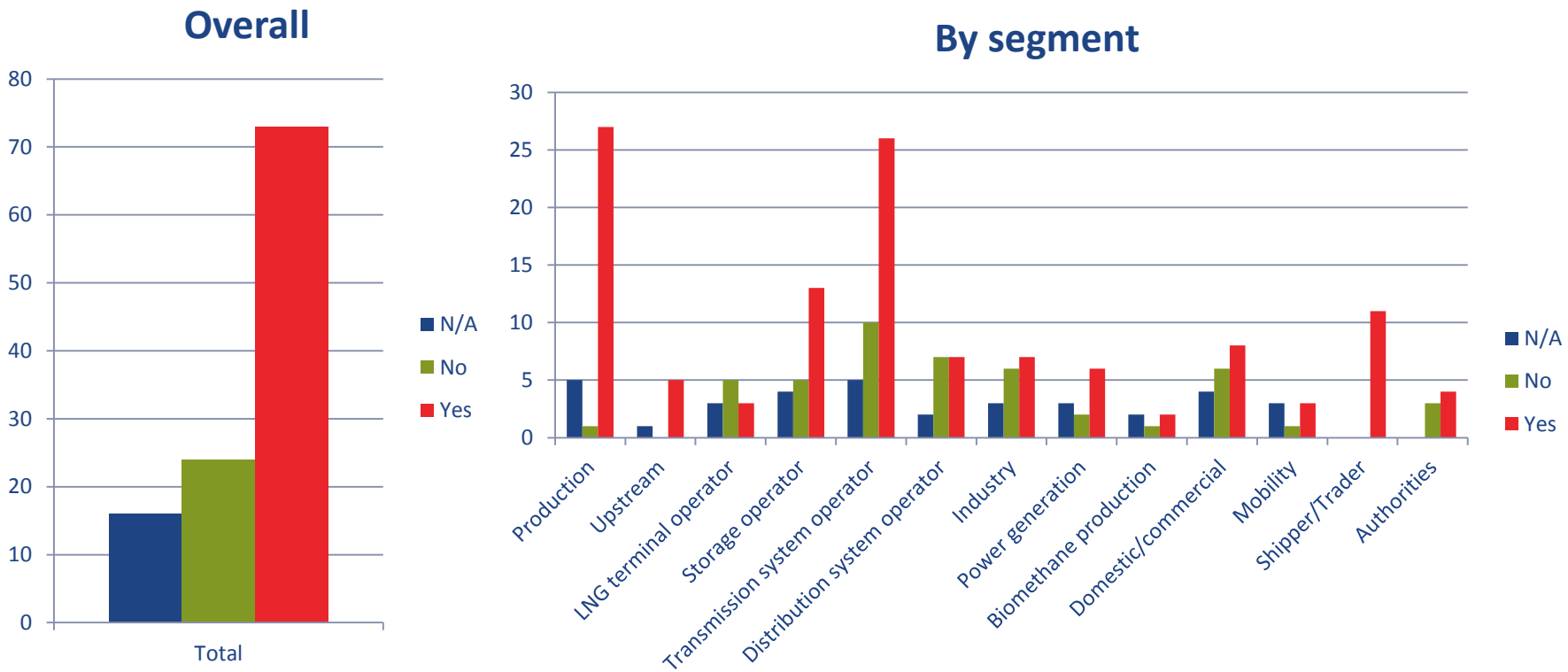


**GCV, WI and odourisation are not covered in the standard*

Section 1: General Questions

7. Is there any segment, region or circumstance whose specific conditions don't allow the application of the standard?



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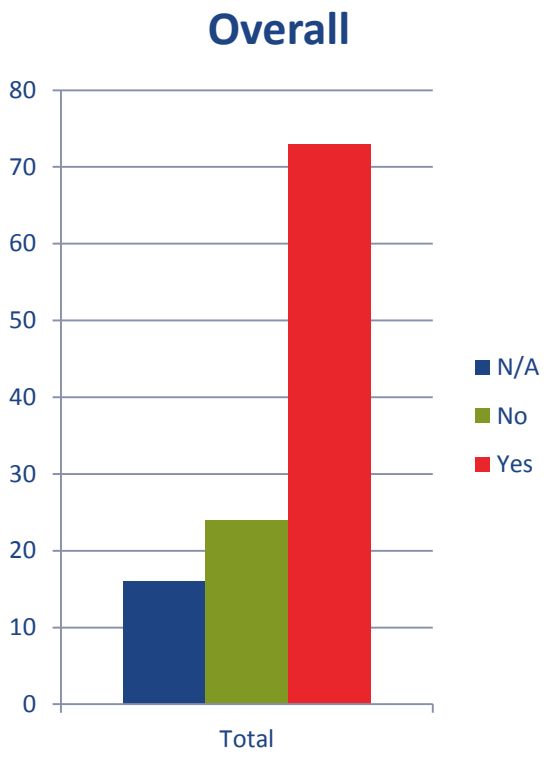
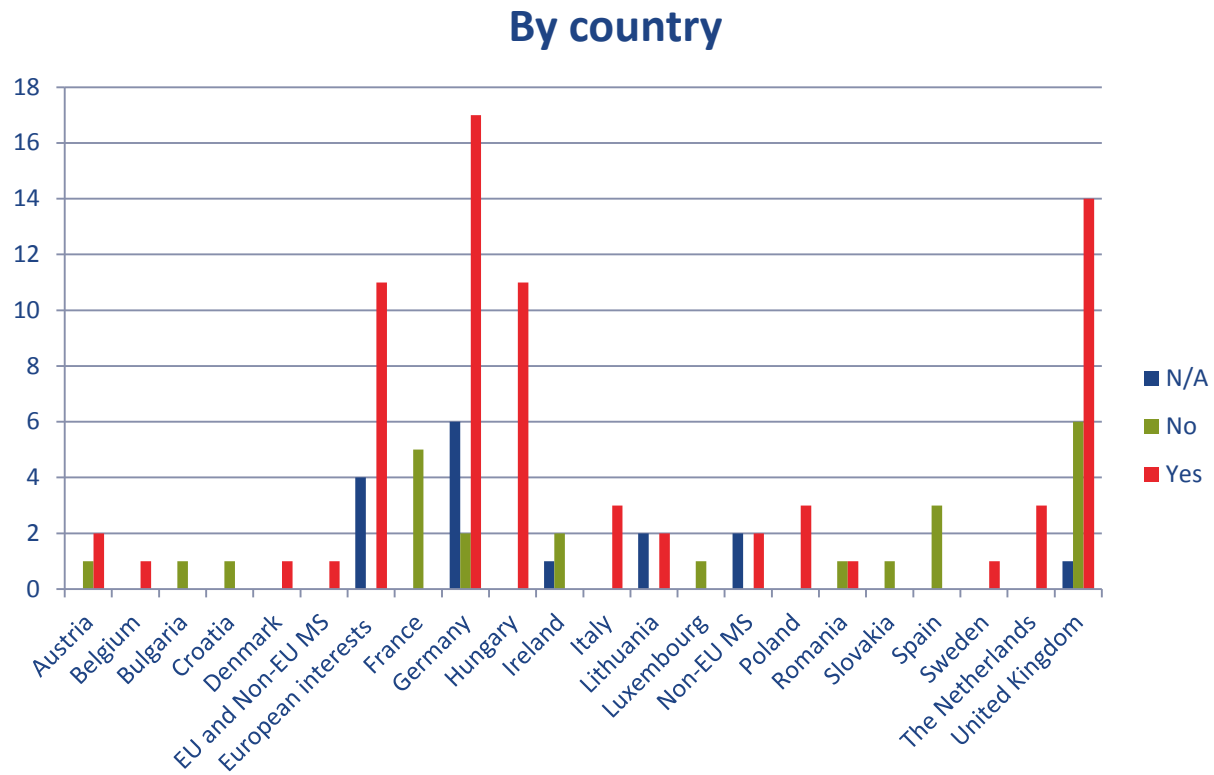




Section 1: Impacts per country

Overview of reported potential impacts per country and parameter

Parameter	AT	BE	DK	DE	HU	IE	IT	LT	NL	PL	ES	UK	NO	RU
Relative density					P									
Total sulfur	S	I		M B	P		I D		L	P		L		
H2S					P									
Mercaptan sulfur														
O2		S	B	B	P					P		PL		P
CO2	S			B	P						I	P	P	
HC dew point					P					P				
Water dew point	S				P					P				
Methane number			B											
Unspecified parameters								F						

S: Storage
I: Imports
B: Biomethane
M: Mobility
D: Distribution
L: LNG
P: Production
F: gas as Feedstock

Only countries reporting specific impacts are included

Section 2: A-deviations

Summary of potential conflicts of the standard with national legislation

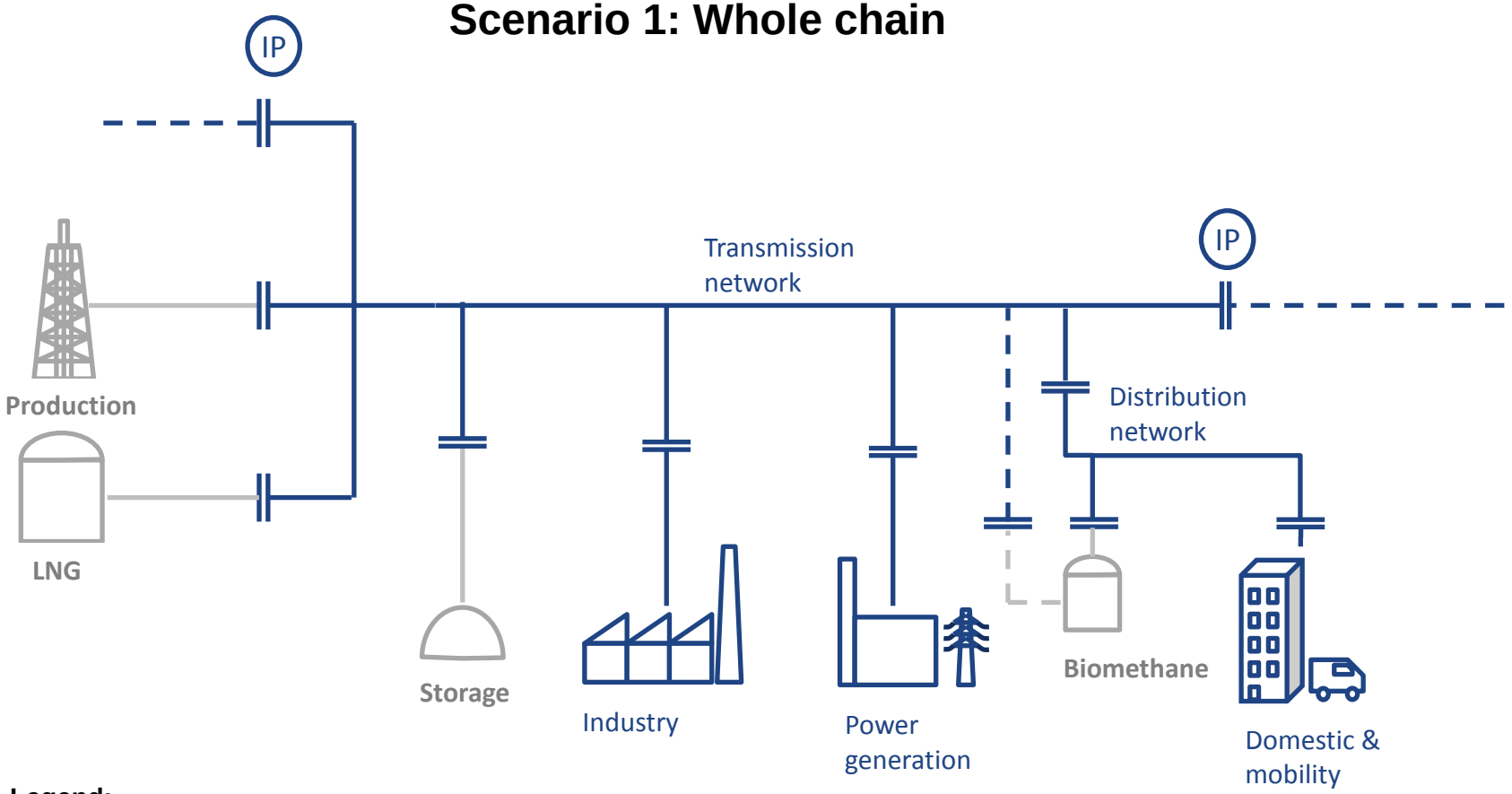
Parameter	AT	BE	HR	DK	DE *	FR	HU *	IE	IT	LT	NL *	PL	ES	UK
Relative density														
Total sulfur														
H2S														
Mercaptan sulfur														
O2														
CO2														
HC dew point														
Water dew point														
Methane number														

Legislation is more strict

Legislation is less strict or not specific

Section 2: Scenario definition

Scenario 1: Whole chain



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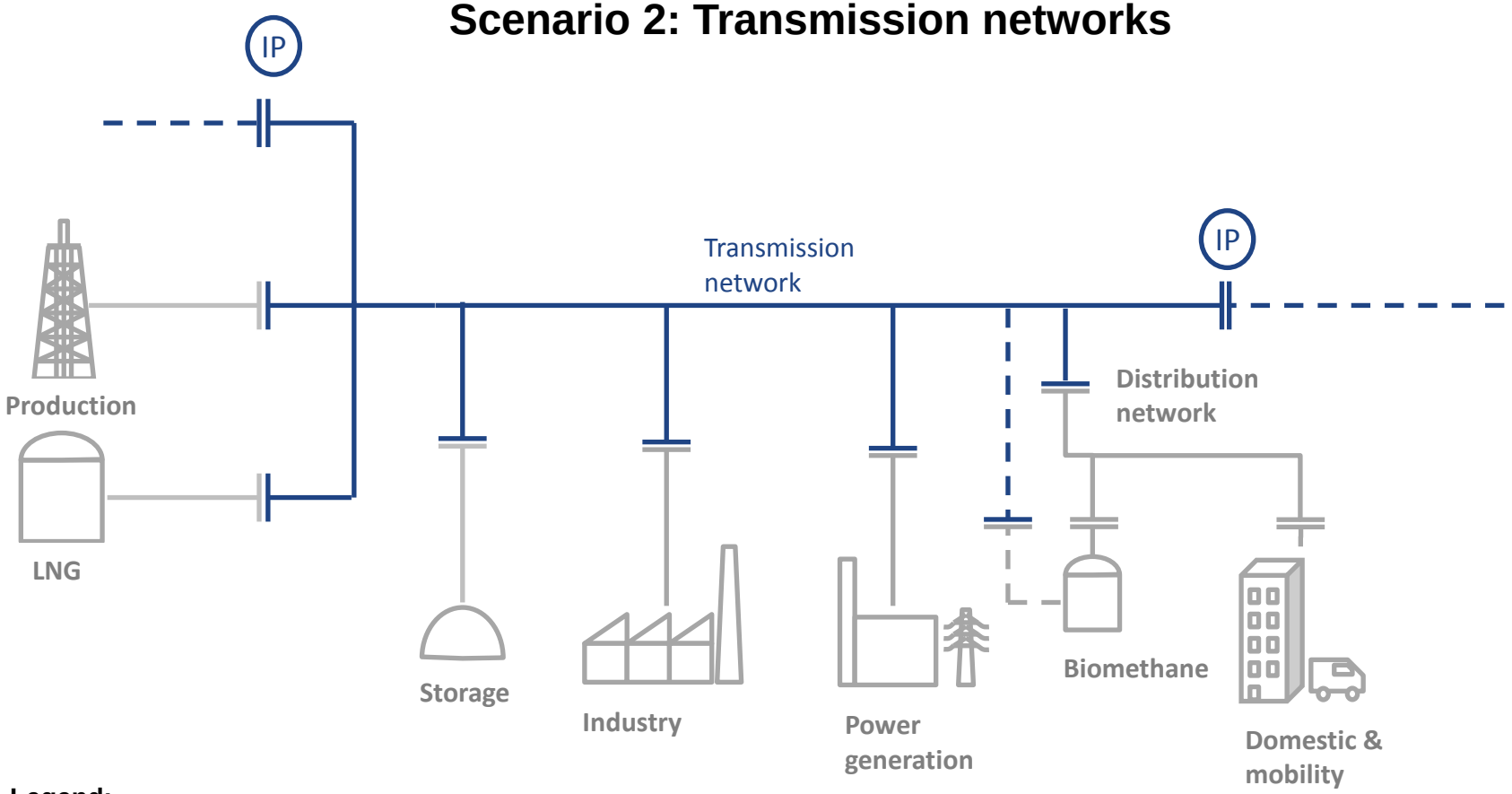
In scope
Out of scope

Section 2: Scenario definition

Scenario 2: Transmission networks



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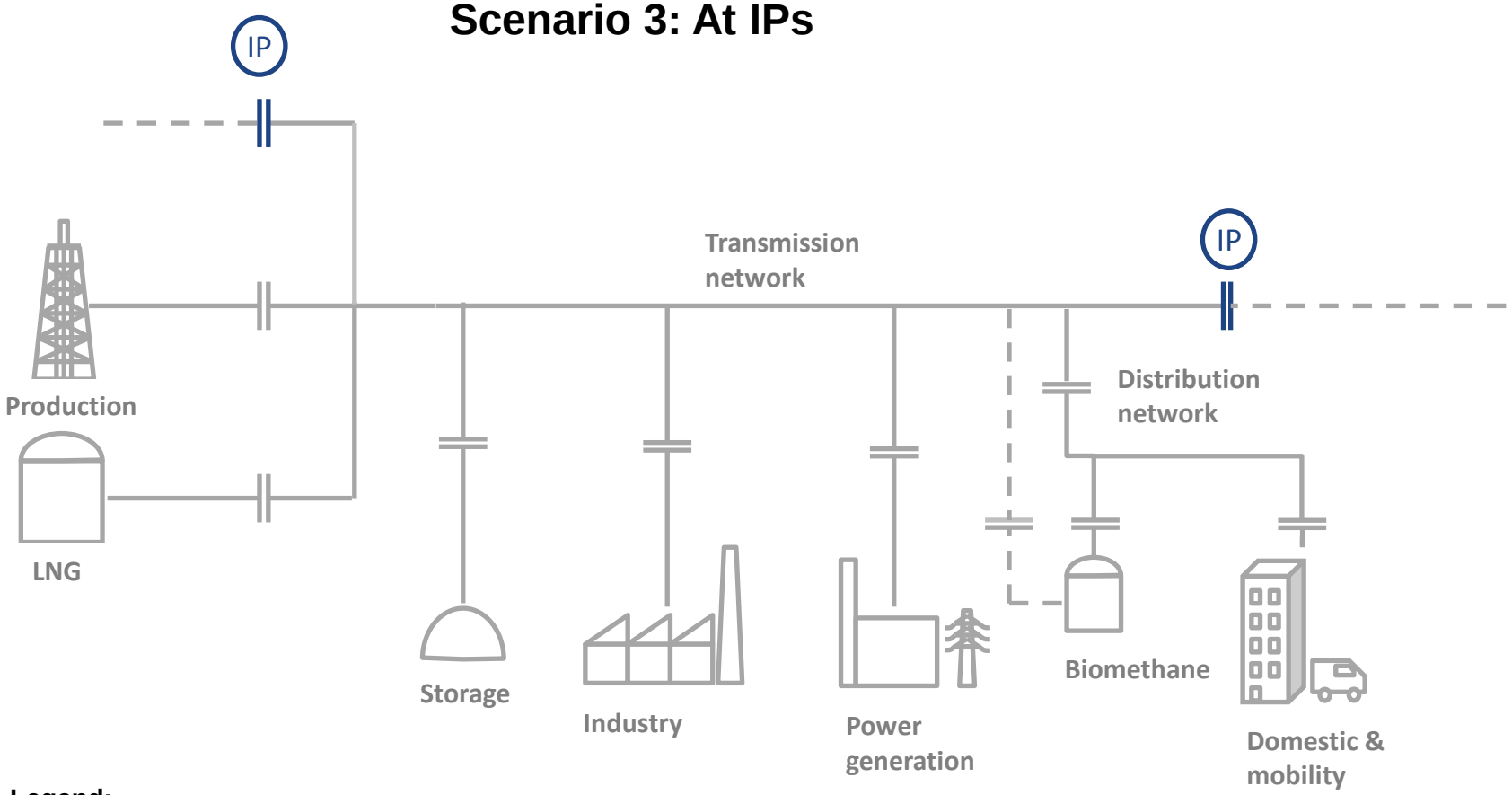
Section 2: Scenario definition

Scenario 3: At IPs



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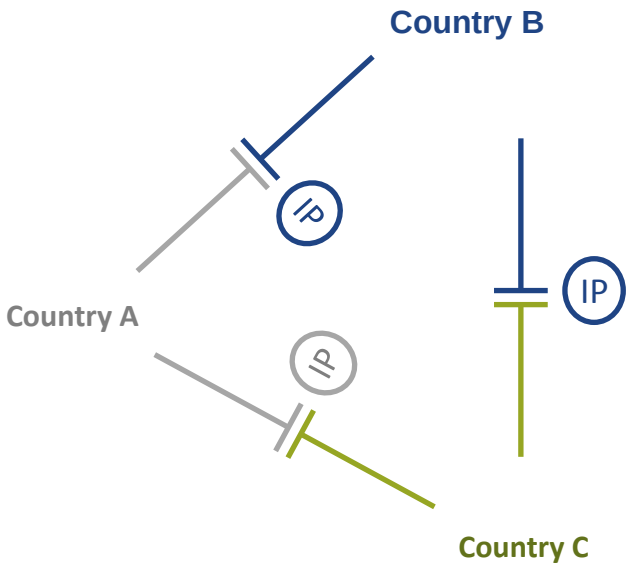
In scope
Out of scope

Section 2: Scenario definition

Scenario 4: Voluntary adoption



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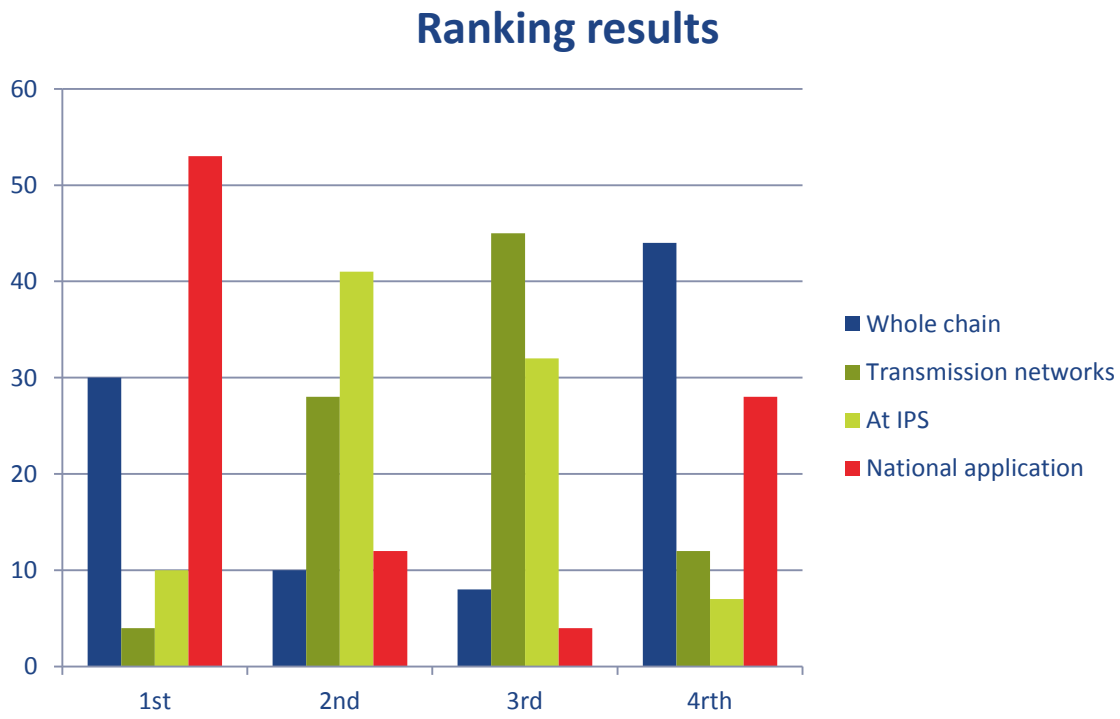
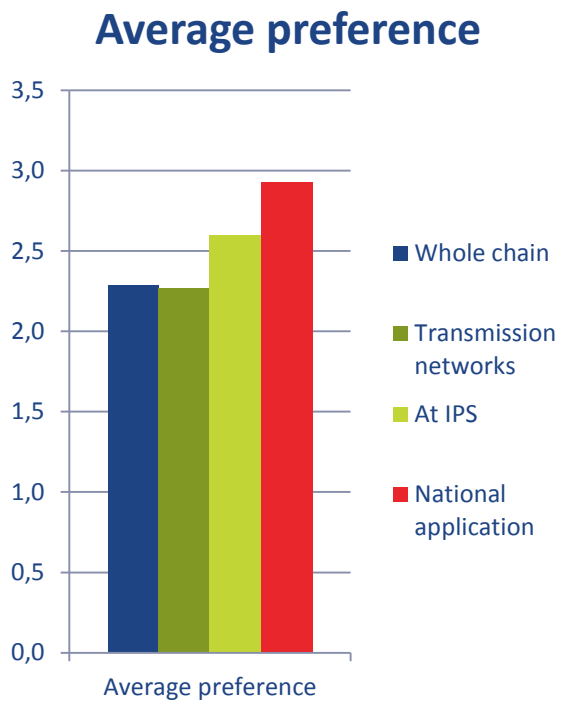
EN 16726
National spec A
National spec C

Section 2: Scenario definition

9. Rank the scenarios in order of preference





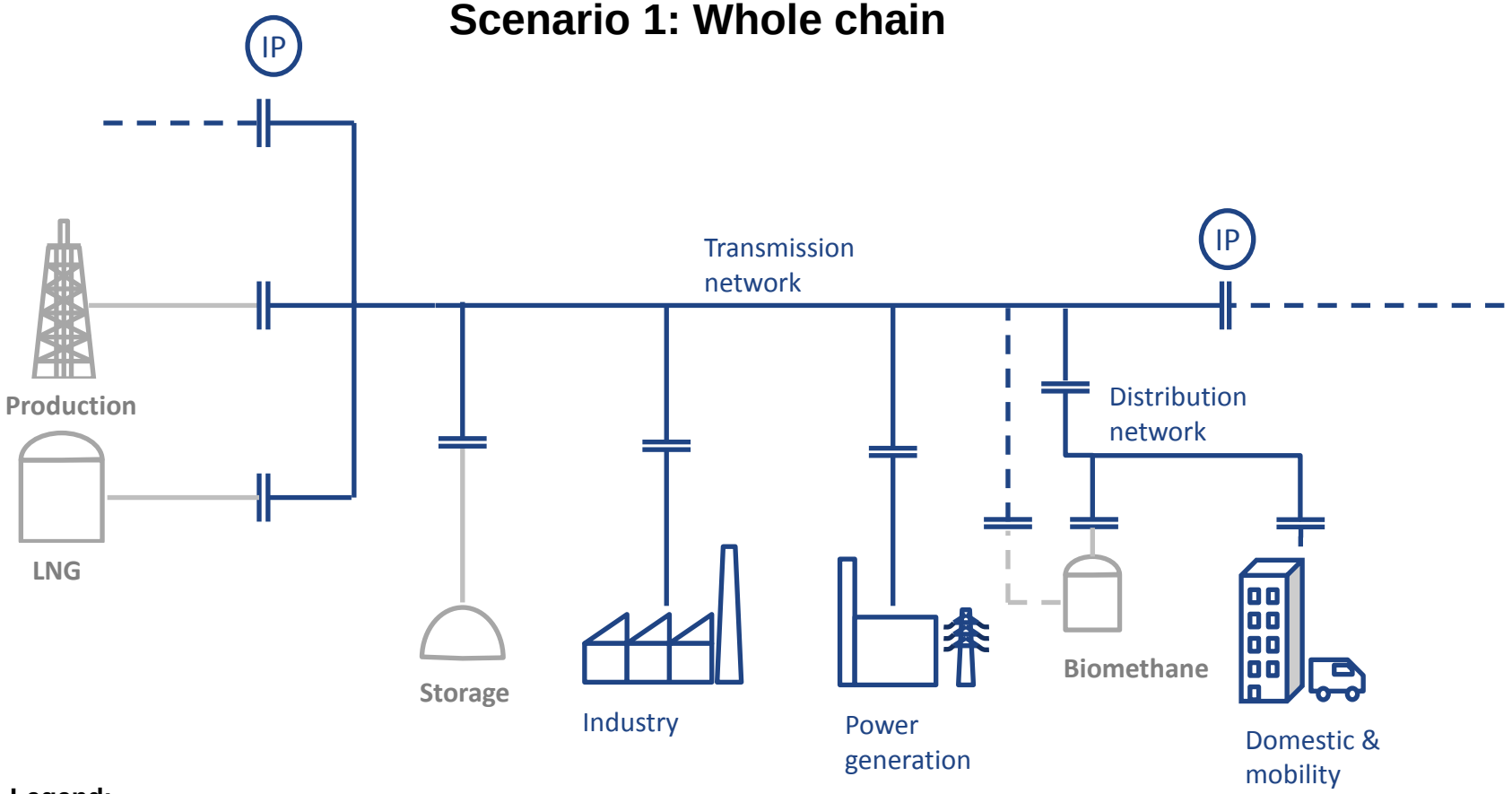
Section 2: Scenario definition

Resulting scenarios

Policy issue	Scenario 1: Whole chain implementation	Scenario 2: Transmission networks only	Scenario 3: IPs only	Scenario 4: Voluntary adoption
1 Scope	Whole chain	Transmission networks only	IPs only	Voluntary adoption
2 Implementation timing	Fixed and equal	?	As decided by national authorities	As decided by national authorities
3 Interaction with INT NC	Article 15 shall not apply after transition	Article 15 shall not apply after transition	Article 15 shall be the only solution	Article 15 shall be the only solution
4a Acceptance of gas meeting the standard	Gas meeting the standard shall be accepted	Gas meeting the standard shall be accepted	Gas meeting the standard shall be accepted	?
4b Allowance for off-spec gas	Operators may agree less strict limits	Operators may agree less strict limits	Operators may agree less strict limits	Operators may agree less strict limits
5 National specifications (A-deviations)	A-deviations withdrawn	A-deviations withdrawn	A-deviations retained	A-deviations retained
6 Flexible limits (O2, CO2, etc.)	Case by case impact assessment	Case by case impact assessment	Case by case impact assessment	As decided by national authorities

Section 3: Impact analysis of scenarios

Scenario 1: Whole chain



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In scope
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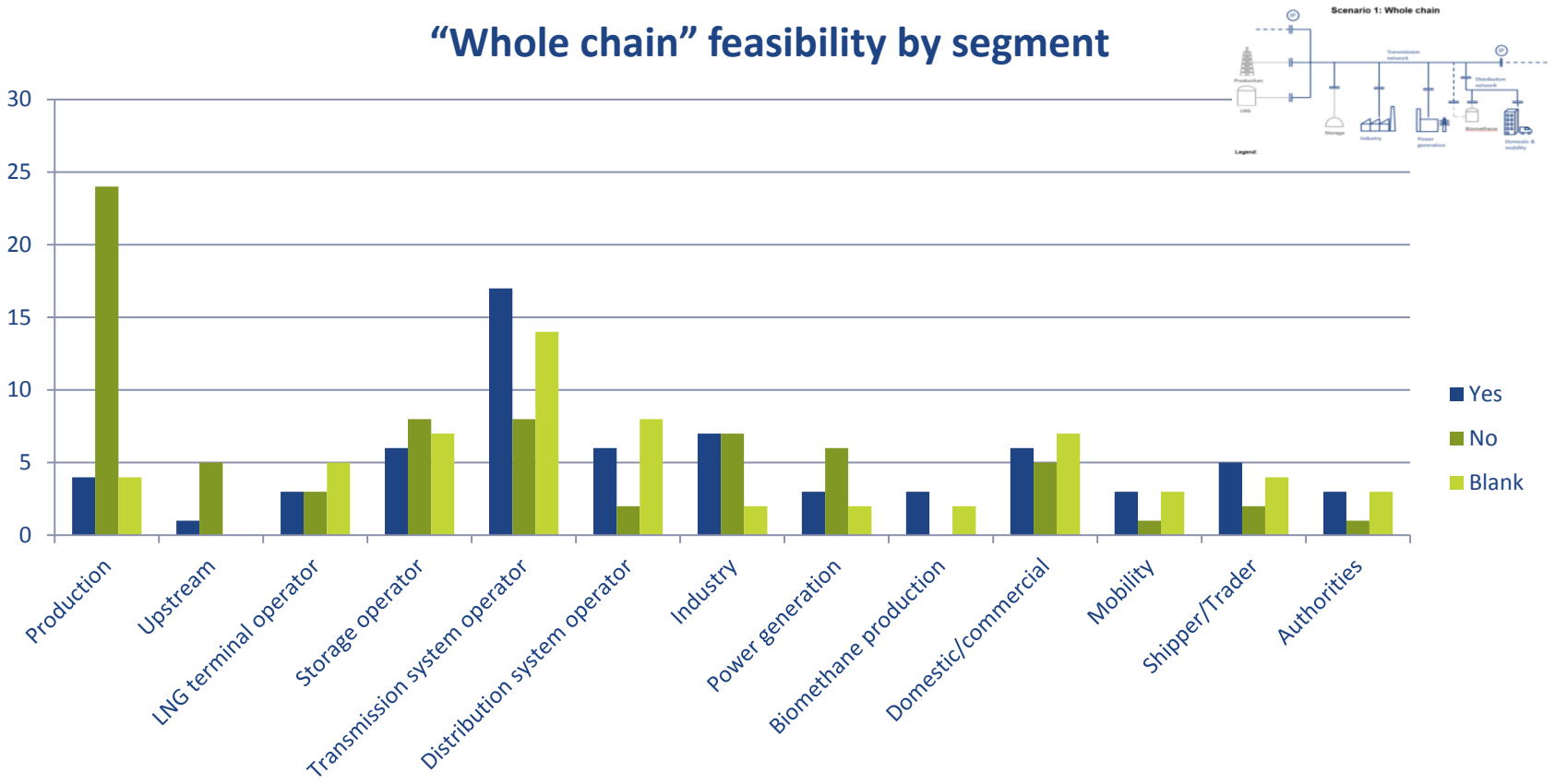
Section 3: Impact analysis of scenarios

30 Is the whole chain scenario feasible for your segment/organisation/country?



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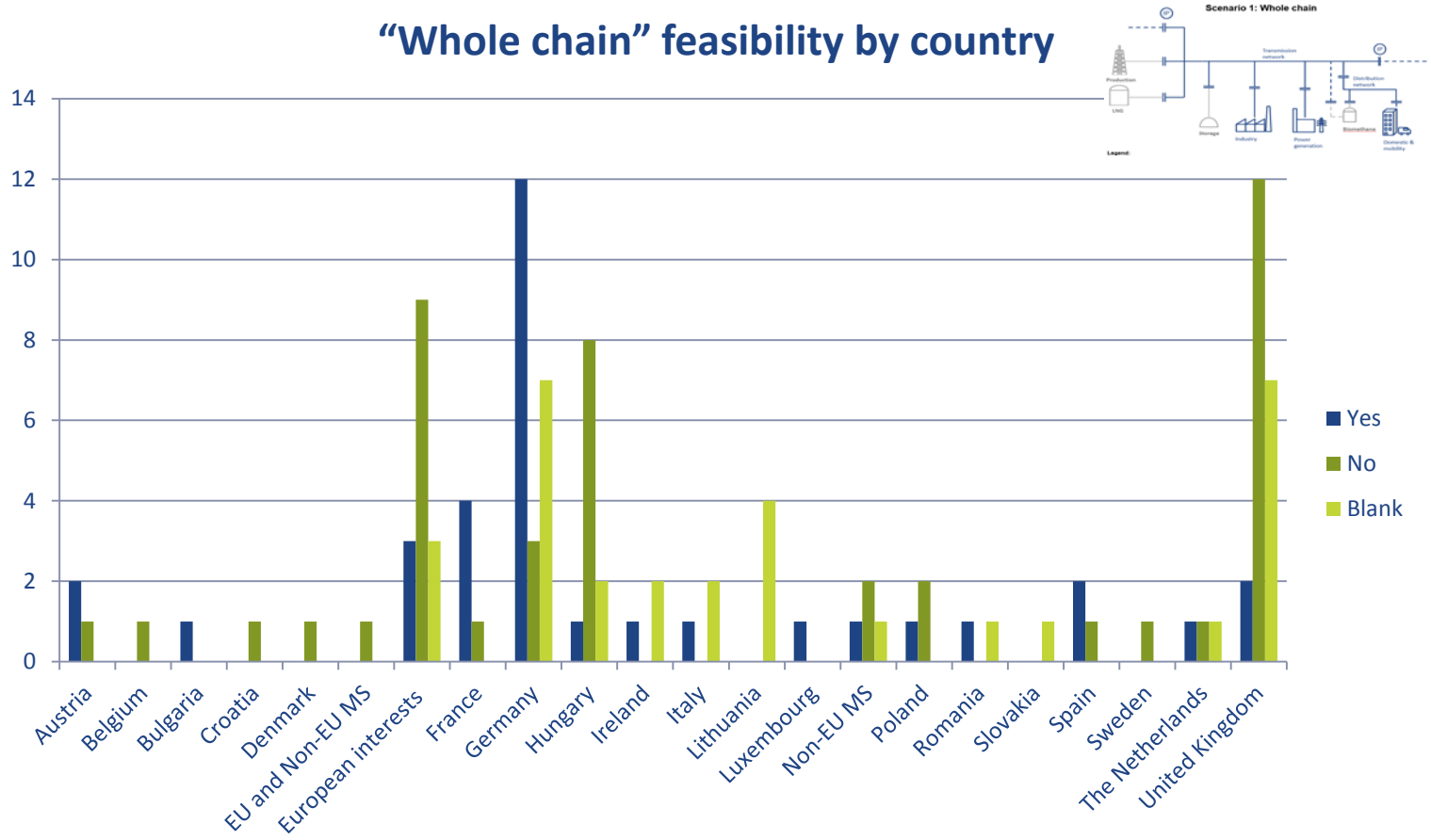

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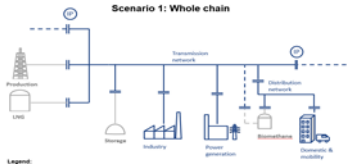
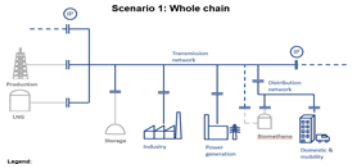


- Benefits:
  - Many stakeholders see no benefit at all
  - Harmonization, clear rules for everyone, transparency, reliability in gas quality
  - All users exposed to the same gas quality, safe operations, mitigations of extra environmental emissions
  - Easier handling of gas flows and better usage of the systems
- Impacts:
  - Huge(prohibitive) extra investments
  - TSO loses the ability to adapt off-spec gas by co-mingling
  - Gas production reduction, negative impact on new sources of gas developments (e.g. 20% UK production shut-in, equivalent to £2 billion)
  - Interruption of flows at IPs (example - 15 bcm at IP with Morocco)
  - Curtailment of fuel stations (sulfur)
  - Negative impact to biogas production
  - Obliges some end-customers to adapt their process
  - Quality variation will affect gas turbines performance, reliability (safety, emissions, increased corrosion, unexpected plug flows)

Section 3: Impact analysis of scenarios

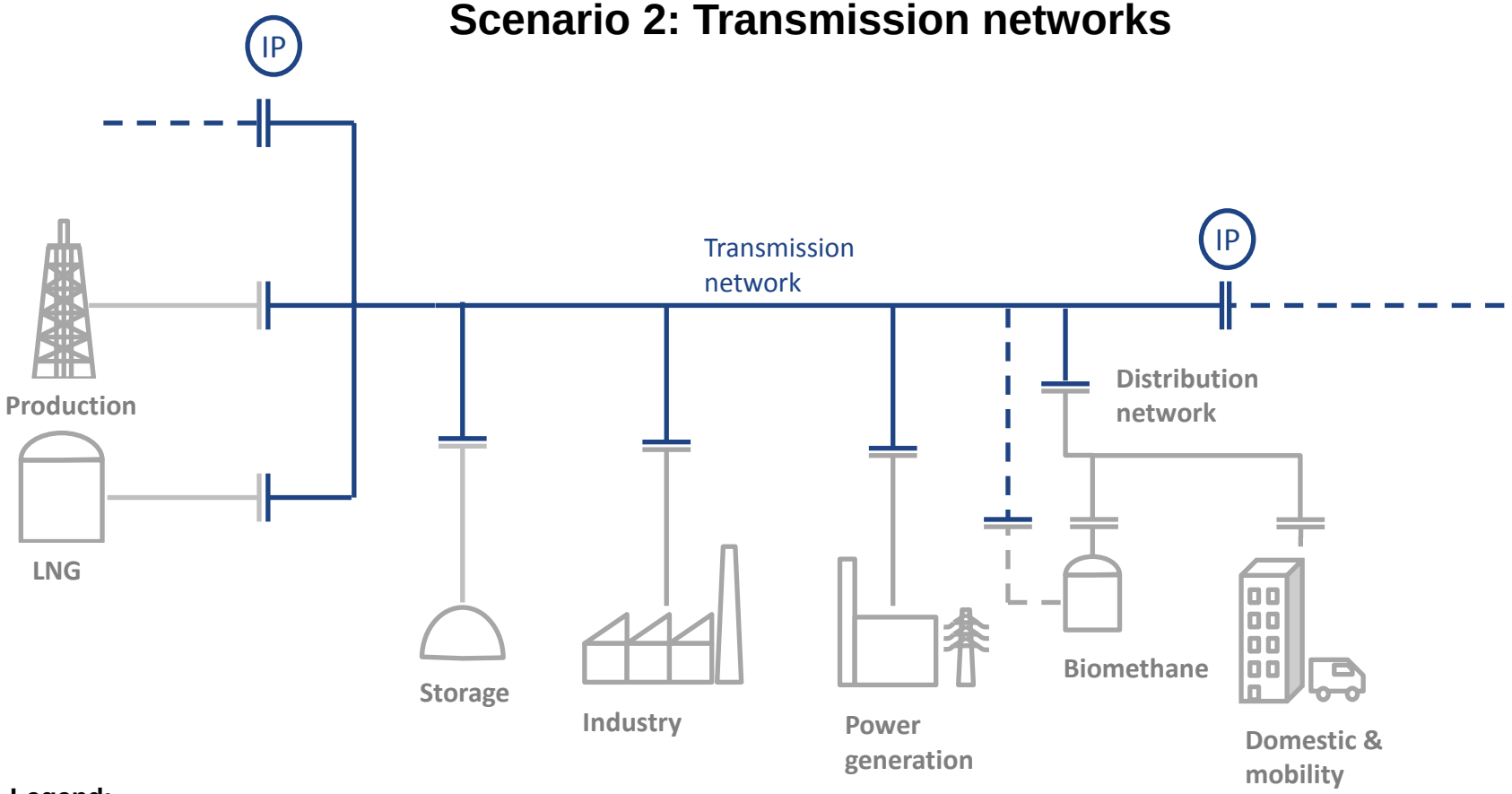
Scenario 1: Whole chain



- Implementation barriers :
  - Current contracts
  - Legal barriers (e.g. sulfur) related to national requirements
  - Existing technological requirements and design of facilities
- Costs:
  - CNG stations need desulphurisation (44.1 M€ reported from 1 MS, assuming 45 k€ per station)
  - Investment in production facilities would be unaffordable.
  - Significant investment required in storage facilities (110 M€ reported from 2 MS)
- Time: 2 to 15 years, being 5 the most common
- Security of supply risks:
  - Gas that is now accepted would become off-spec, reducing supply portfolio
  - The treatment installations could not be built in time
- Impact in price:
  - Investment costs need to be recovered and reduction of supply portfolio will affect gas prices

Section 3: Impact analysis of scenarios

Scenario 2: Transmission networks

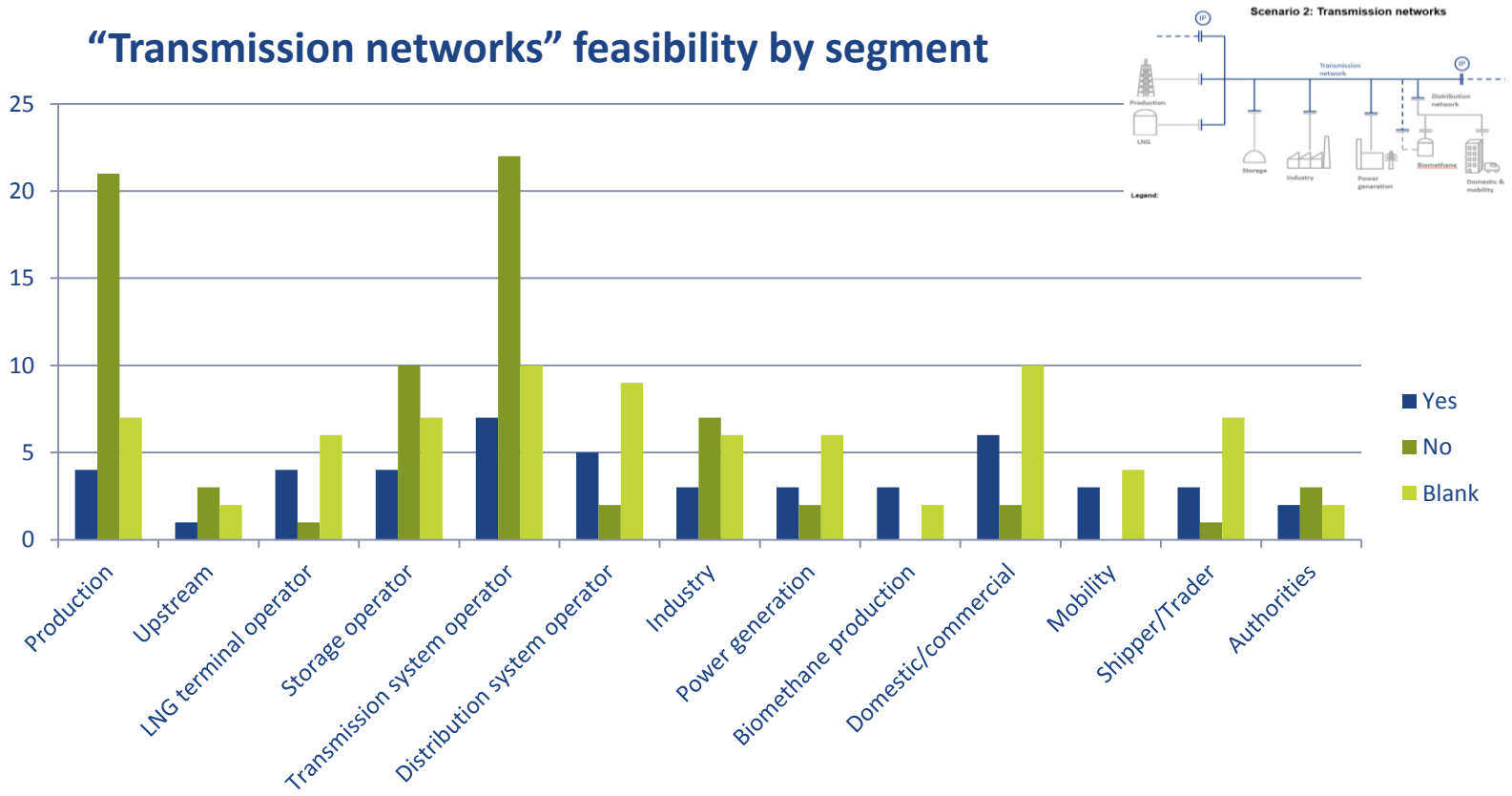


Legend:

In scope
Out of scope

Section 3: Impact analysis of scenarios

39 Is the transmission networks scenario feasible for your segment/organisation/country?



Section 3: Impact analysis of scenarios

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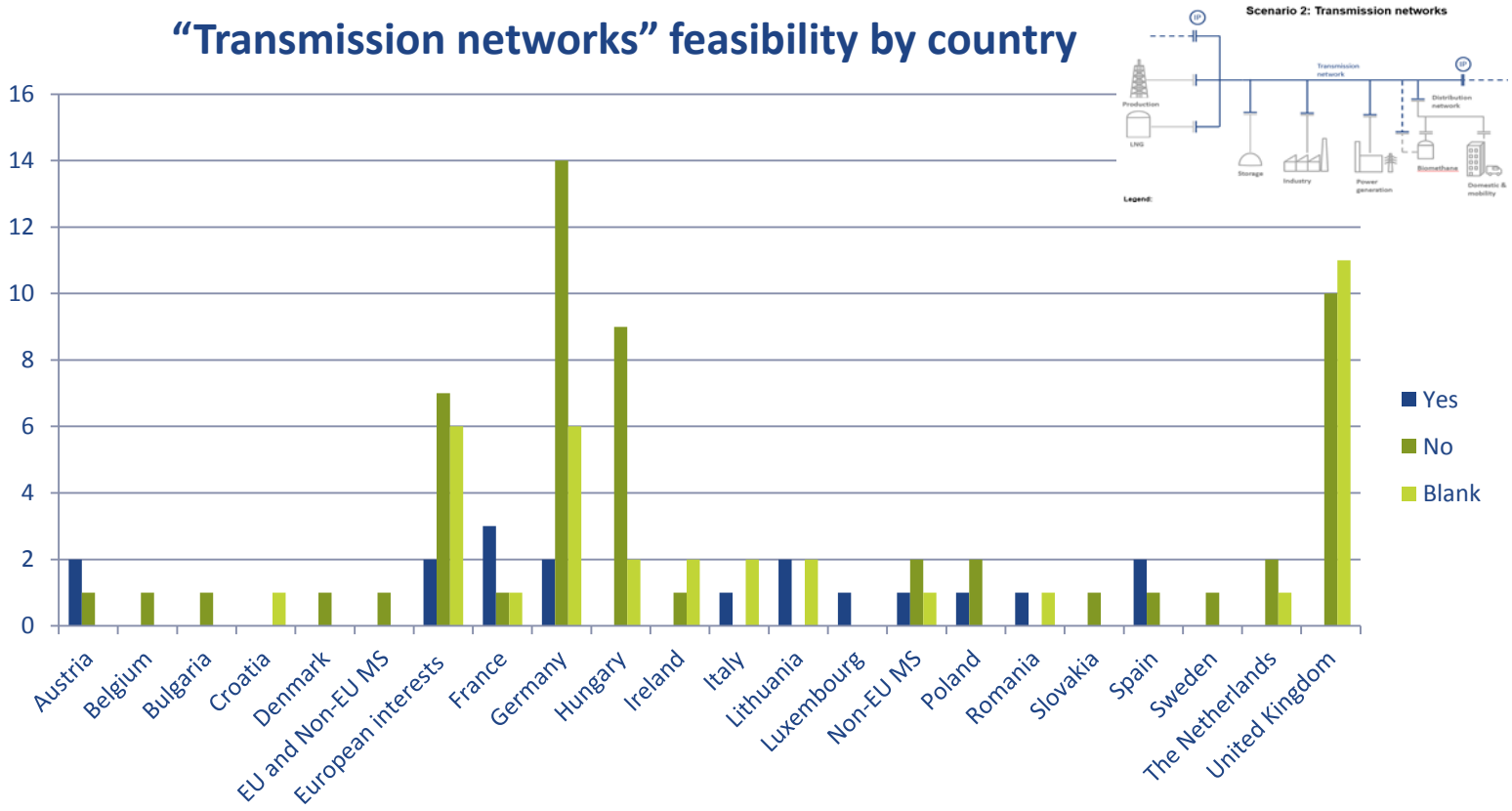
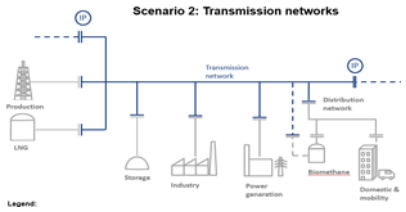


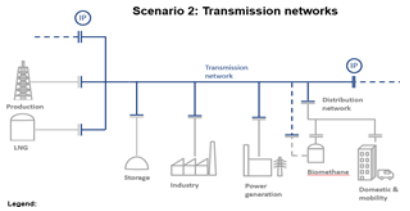
Section 3: Impact analysis of scenarios

Scenario 2: Transmission Networks



- Benefits:
  - Many stakeholders see no benefit at all
  - All treatments only on TSO level
  - More flexibility for upstream and downstream counterparties
  - Diversification of the supply sources
  - More flexibility for non-conventional sources
- Impacts:
  - Huge investments on TSO level (treatments, including small plants + gas quality Control, for "sensitive clients“, etc) potentially on every single connection point
  - The TSO will not get gas with quality guarantee of EN 16726 but on the next grid connection point TSO has to fulfill EN 16726
  - Only TSO have responsibility
  - TSO could loose the ability to adapt off-spec gas from producers by co-mingling
  - Problems if a different standard applied on distribution networks
  - Less harmonisation at end-user level

Section 3: Impact analysis of scenarios

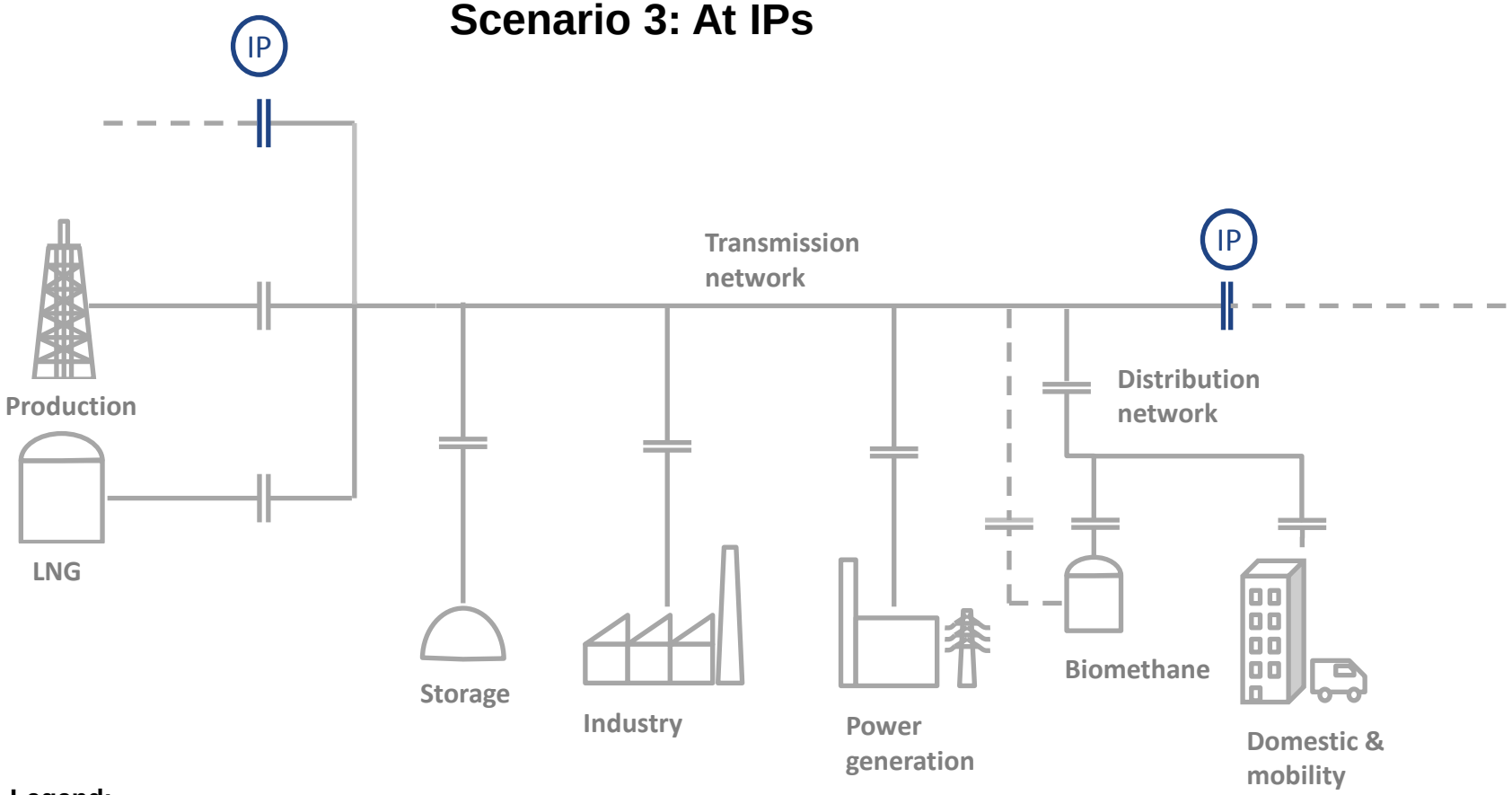


Scenario 2: Transmission Networks

- Implementation barriers :
  - Current contracts
  - Legal barriers (e.g. sulfur) related to national requirements
  - Existing technological requirement and design of facilities
- Costs:
  - In addition to whole chain costs, 75 M€ per connection point per treatment installation on average (assuming 500,000 m3/h)
- Time: 2 to 20, being 10 years most common answer (TSO gas treatment facilities)
- Security of supply risks:
  - Gas that is now accepted would become off-spec, reducing supply portfolio
  - The treatment installations could not be built in time
- Impact in price: high increase of transportation fee
- Remark: it should also be determined, that distribution grid operators should not have stronger limits that defined in the EN16726, i.e. all gases coming from transportation grids are acceptable by distribution grids. Distribution grids are allowed to accept less strict limit values for single values (i.e. O_2 or CO_2)

Section 3: Impact analysis of scenarios

Scenario 3: At IPs

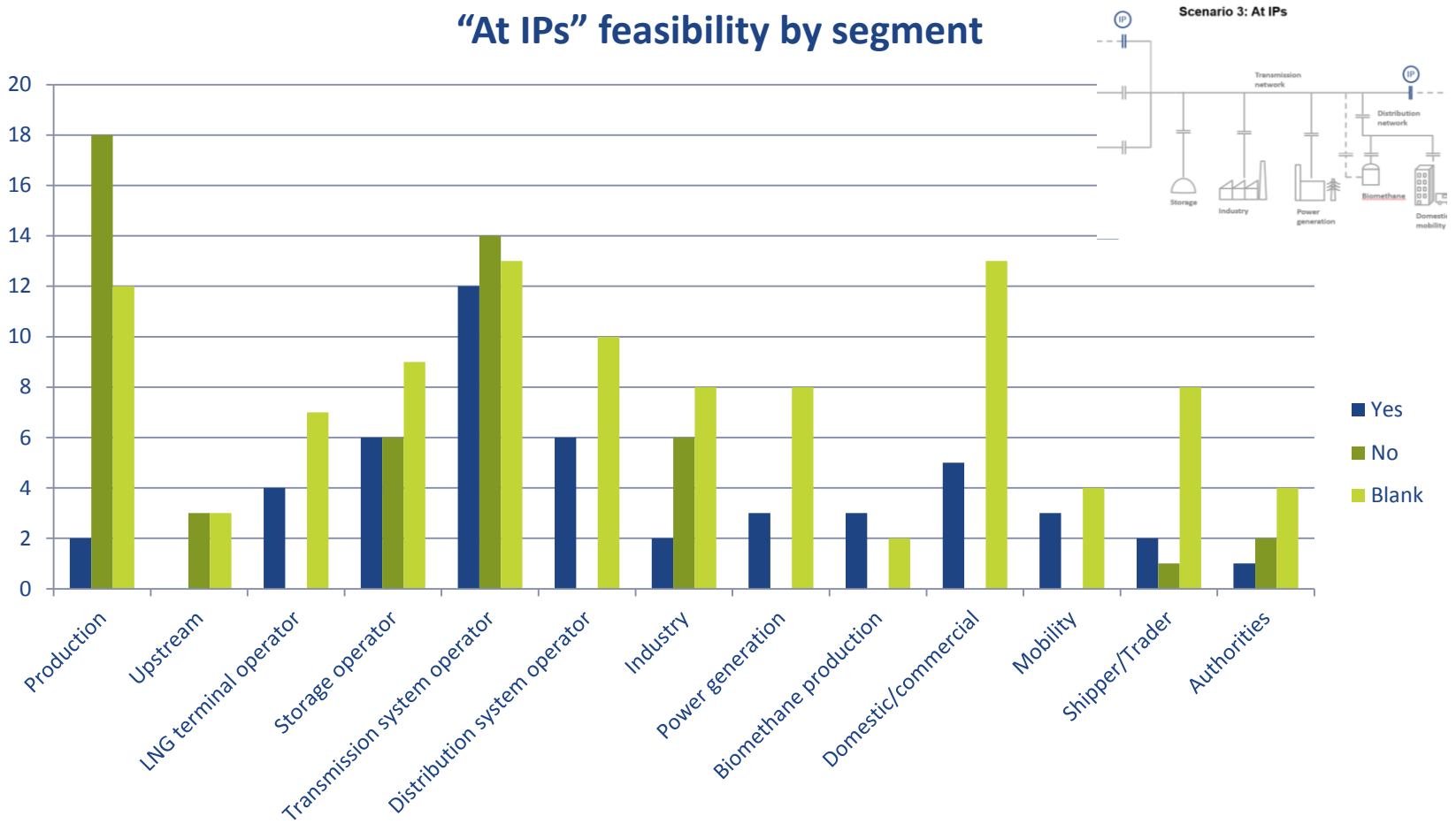


Legend:

In scope
Out of scope

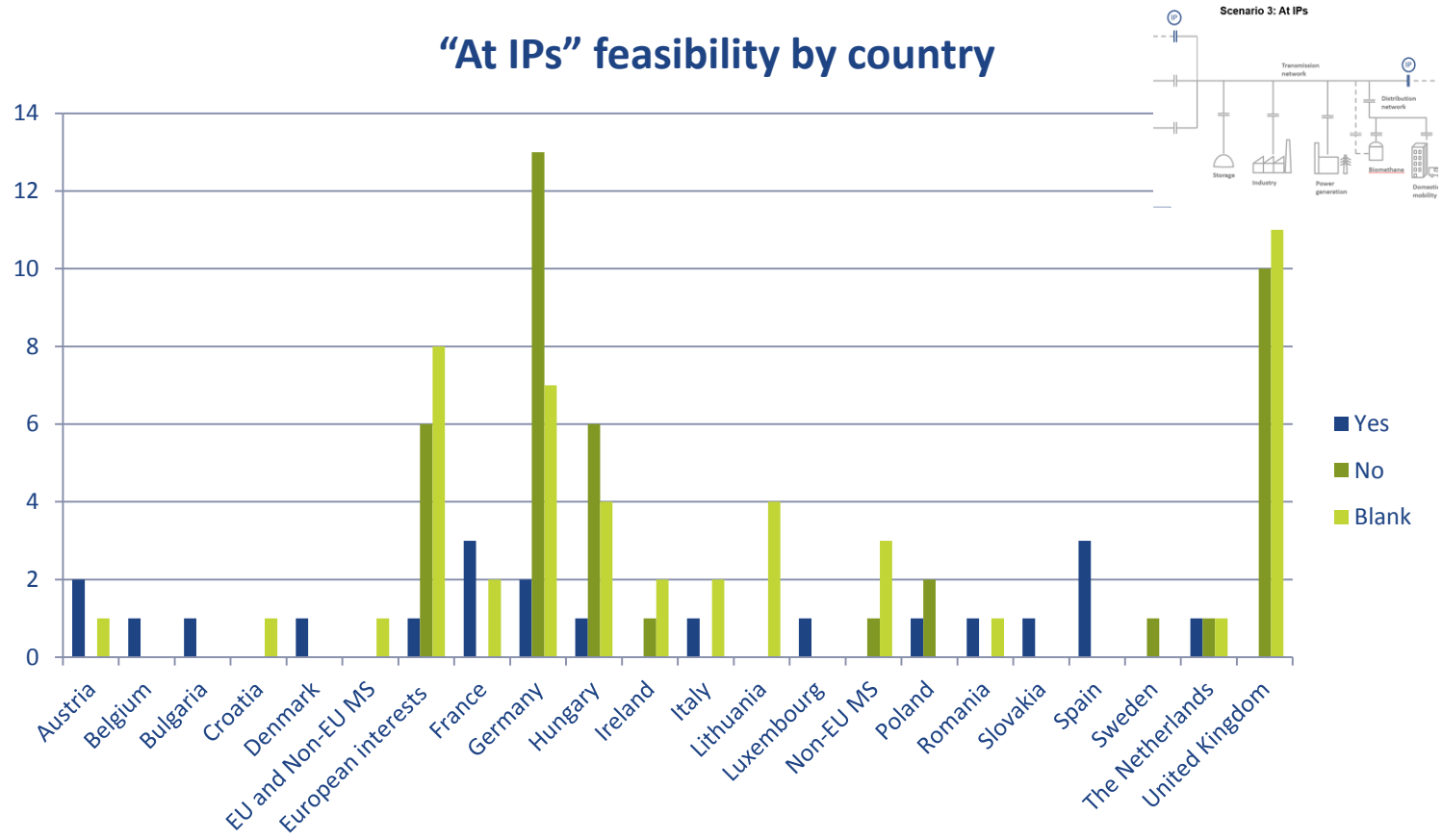
Section 3: Impact analysis of scenarios

48 Is the "At IPs" scenario feasible for your segment/organisation/country?

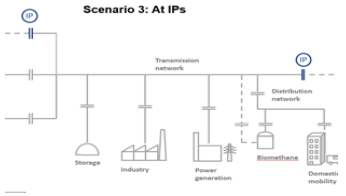


Section 3: Impact analysis of scenarios

48 Is the "At IPs" scenario feasible for your segment/organisation/country?



Section 3: Impact analysis of scenarios



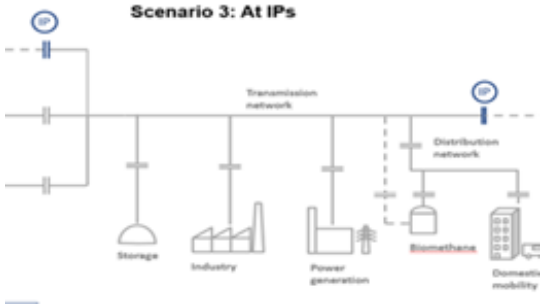
Scenario 3: At IPs

- Benefits:
  - Many stakeholders see no benefit at all
  - Allows to co-mingle gas flows on the Transmission System in order to accept off-spec gas
  - Facilitates discussions between TSO and helps to agree Interconnection agreements when they are looking for options to solve an off-spec gas event
  - Gives more flexibility to develop new sources of gas and to receive off-spec gas
  - Scenario is in the scope on INT NC
- Impacts:
  - Gas treatment installations for huge flows would be necessary
  - End users and downstream connected to gas transmission and distribution system could receive off-spec gas. Poor harmonisation at user side
  - Suboptimal specification at a border station, e.g. at a border station between two countries where there currently are no issues on this parameter outside the requirements in the CEN standard – creating additional cross border barrier
  - Blending may not be enough to meet CO_2 2.5% for some fields
  - Domestic gas could be off-spec and not be transmitted through IP, complicating the operation of the system or treatment could be needed

Section 3: Impact analysis of scenarios

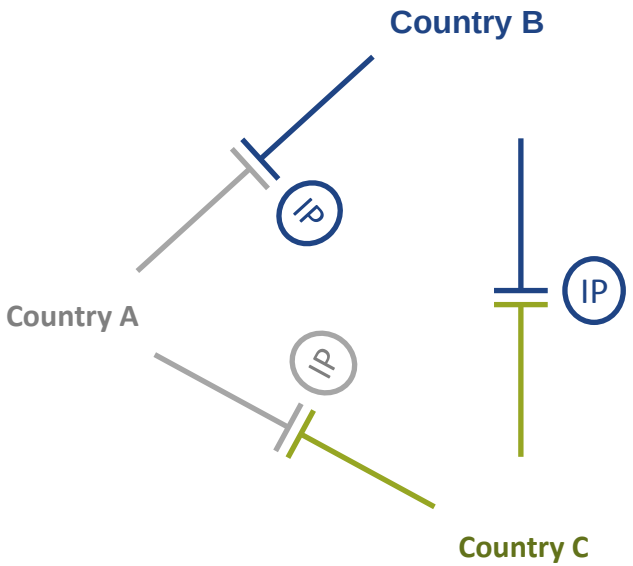
Scenario 3: At IPs

- Implementation barriers :
  - Unmatched legal framework EU and national gas quality requirements
- Costs:
  - In addition to whole chain costs, 75 M€ per IP per treatment installation on average (assuming 500,000 m3/h)
- Time: responses varying from 2 to 10 years, and faster than Scenario 1 and 2.
- Security of supply risks:
  - Legal obligations on IPs without harmonized definition for national downstream sector could lead to physical shut-in or restriction on IPs or production.
  - The risk of supplying gas appliances and chemical companies using gas as a feedstock
- Impact in price: transport fees will increase



Section 3: Impact analysis of scenarios

Scenario 4: Voluntary adoption

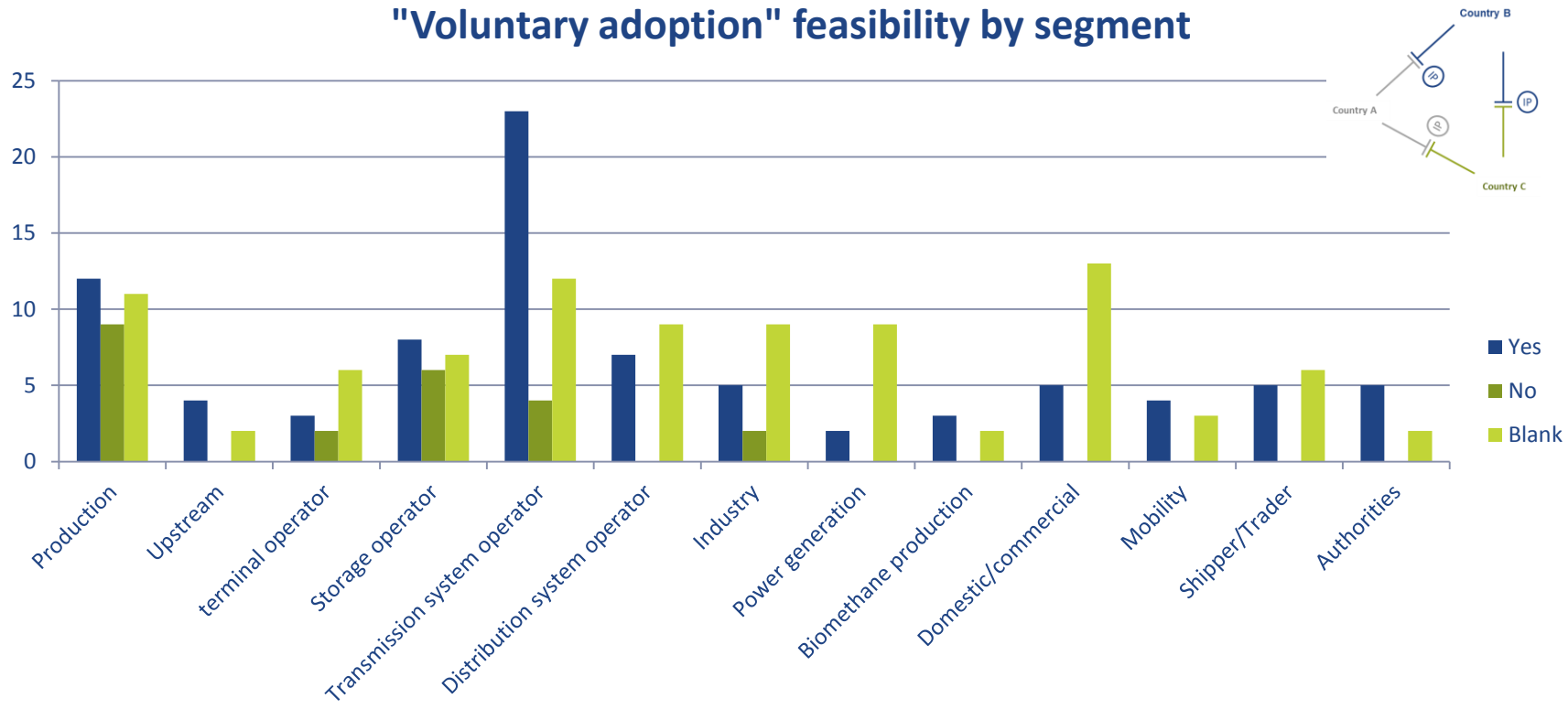


Legend:

EN 16726
National spec A
National spec C

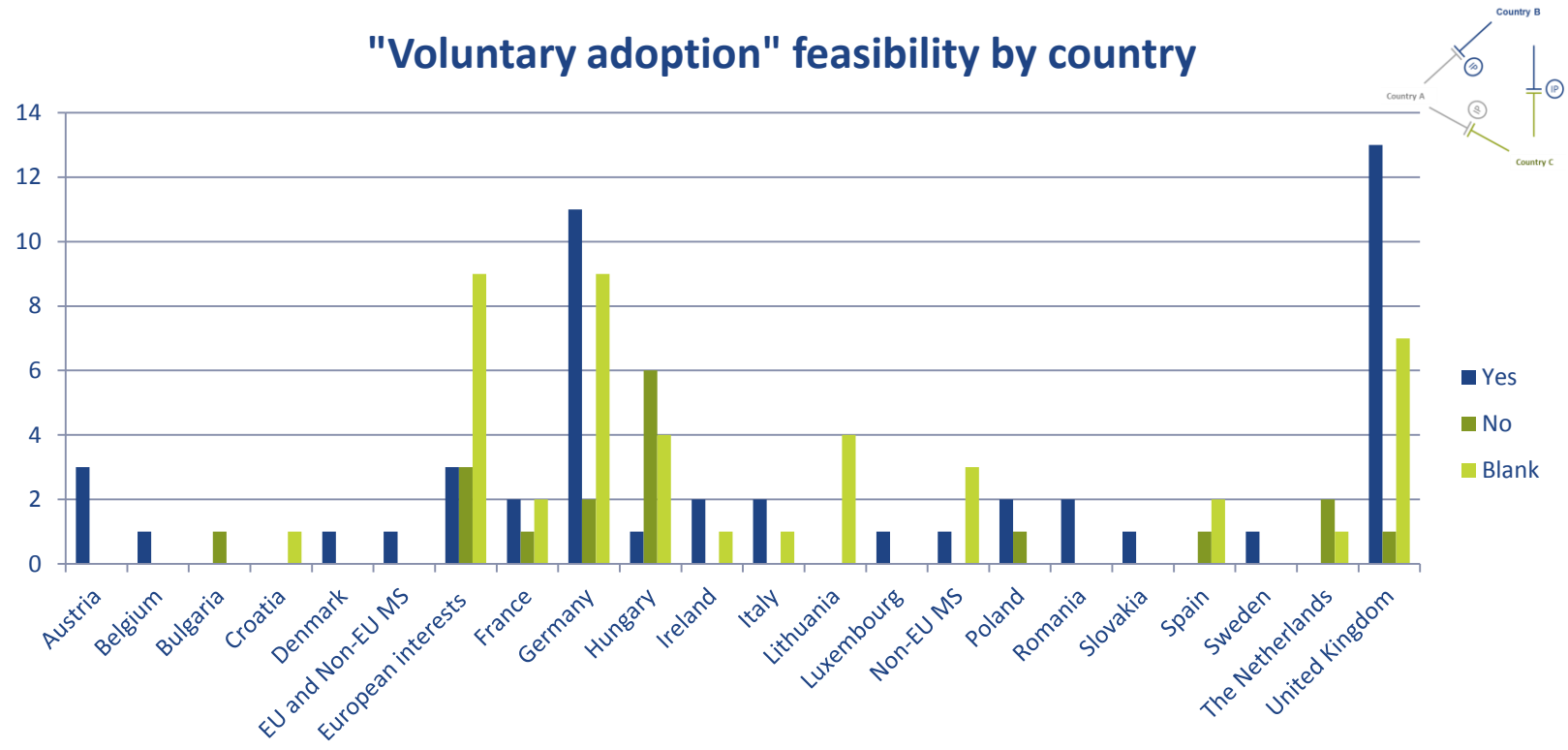
Section 3: Impact analysis of scenarios

57 Is the voluntary adoption scenario feasible for your segment/organisation/country?



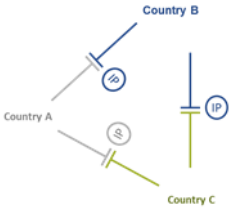
Section 3: Impact analysis of scenarios

57 Is the voluntary adoption scenario feasible for your segment/organisation/country?



Section 3: Impact analysis of scenarios

Scenario 4: Voluntary adoption



- Benefits:
  - Flexibility in the adoption of the standard
  - Allows Member States to take account of local conditions
  - Freedom to make changes with partner Member States, building relationships to resolve issues on a bilateral basis. Existing INT NC could solve quality issue
- Impacts:
  - Risks in terms of SOS which are linked to the mismatch of (national) gas quality specifications. One gas which complies with the national specification in one country could be refused in another country
  - Interruptions may occur
  - Legal uncertainty not solved
    - e.g. If one country adopts the standard the new requirements may be different to the national standards of the adjacent countries leading to potential barriers

Section 3: Impact analysis of scenarios

Scenario 4: Voluntary adoption

> Implementation barriers : financial and legal (if the standard is adopted by a given MS)

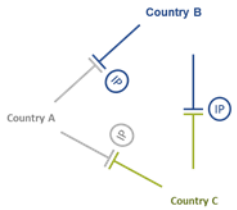
> Costs: no, as it is current situation

> Time: depending on MS national decision

> Security of supply risks:

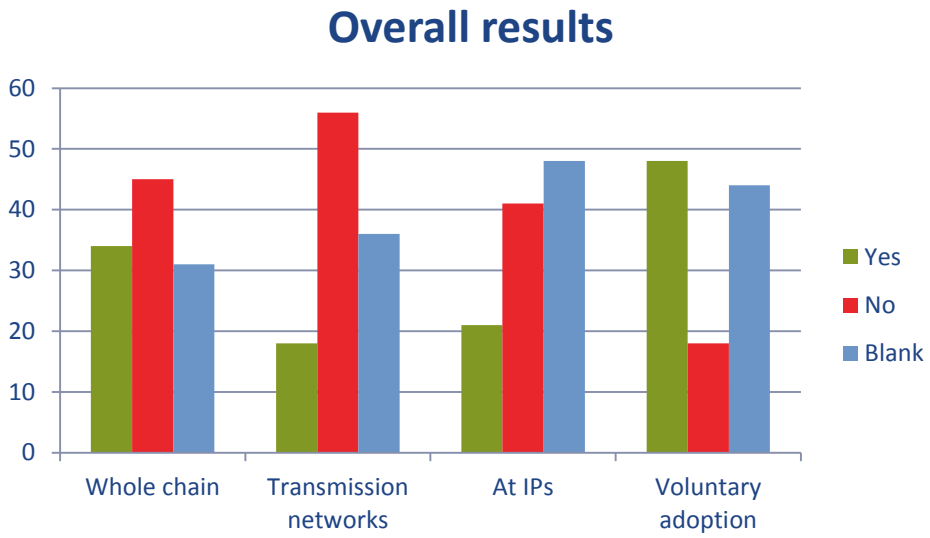
- For some stakeholders, there is interruption risk due mismatching specs
- Others see security of supply risks completely avoided in this scenario

> Impact in price: n.a



Section 3: Impact analysis of scenarios

Is this given scenario feasible for your segment/organisation/country?



Section 3: Impact analysis summary

Policy issue	Scenario 1: Whole chain implementation	Scenario 2: Transmission networks only	Scenario 3: IPs only	Scenario 4: Voluntary adoption
Benefits	No benefits vs certainty and clear rules	No benefits vs More flexibility for local specs	No benefits vs More flexibility for taking in off-spec	MS flexibility vs no benefits
Impacts	Production shut-in Biomethane barrier Investment in storages LNG barrier Security of supply	Whole chain plus Investment in transmission Less harmonisation at end-user level	Some cross-border flows become off-spec Gas treatment costs for TSOs Less harmonisation for end-users	Risks for SoS (interruptions) due mismatching specs Legal uncertainty not solved
Barriers	Financial, legal (e.g. sulfur requirement for CNG)	Financial and legal. Managing different specs entry-exit	Financial and legal. Managing different specs entry-exit	Financial and legal (if decided to apply nationally)
Costs	Insufficient input but indications of possible significant costs	Insufficient input but indications of possible significant costs	Insufficient input but indications of possible significant costs	N/A
Time	From 2 to 20 being 5 years most common	From 2 to 20 being 10 years most common	From 2 to 20 being 10 years most common	Depending on MS decision
Feasibility	Yes (31%) No (41%)	Yes (16%) No (51%)	Yes (19%) No (37%)	Yes (44%) No (16%)

Section 3: Complementary remarks

- Producers:
  - We have not seen any attempt to identify or substantiate possible benefits of amending the INT NC
  - Legal: whole chain goes beyond regulation 715/2009 and Directive 2009/73/EC
  - Subsidiarity principle not respected
- Infrastructure operators:
  - concerns on cost recovery of the treatment facilities, especially if benefits cannot be demonstrated.
  - Uncertainty in application of flexible limits.
  - TSOs point to the unclear situation with gas flow from non-EU countries that are not obliged to implement CEN Standard
- DSOs: concerns on biomethane requirements if reinjected into transport
- Traders:
  - Potential discouragement of gas use
  - gas treatment costs will be passed to infrastructure users

Section 3: Complementary remarks

- Power generation and mobility:
  - Relative density range in the standard allows for a very wide Wobbe Index range
  - Quality variations will affect gas turbines performance and reliability
  - Different national environmental requirements are a barrier
- Industrial users: impact is difficult to assess without WI. All users exposed to a known gas quality is beneficial
- Heating sector and many others see no need to amend INT NC with CEN Standard as long as there is no full standard available (including Wobbe; Wobbe Variation; etc)
- Some stakeholders advise gathering more knowledge about the needs of the end consumers. It should be infrastructure operators and NRA task and/or responsibility to provide a well-based impact analysis.
- General: the standard lacks a definition of sensitive installation

Thank You for Your Attention

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