EUTurbines comments to

ENTSO-G Public consultation on issues and impacts related to the CEN gas quality standard EN16726:2015

(Overview of questions answered)

Section 1: General questions

6. *Is there any other policy issue you think should be considered in addition to the ones already identified?*

Emissions compliance – The gas composition reaching gas turbines needs to be stable at a defined narrow bandwidth. Variations in the gas quality out of pre-defined bandwidth can, not only affect the performance of the gas turbine, but also cause emissions that exceed the existing legislative requirements, as outlined in the Industrial Emissions Directive and in the Large Combustions Plants BREF. Modern premixed burners, with their substantially lower emissions, are in some cases more sensitive to changes in the gas composition compared to traditional burners.

Section 2: Scenario definition

Policy issue 1: Scope

9. *Rank the scenarios in order of preference*

- **Scenario 4:** National application on a voluntary basis (**voluntary adoption**).
- **Scenario 3:** **At IPS**: meaning connection points between two different TSOs and balancing zones.
- **Scenario 2:** **Transmission networks.**
- **Scenario 1:** **Whole chain**: same scope as EN16726. That starts at entry points.

Policy issue 6. Flexible limits

Options considered:

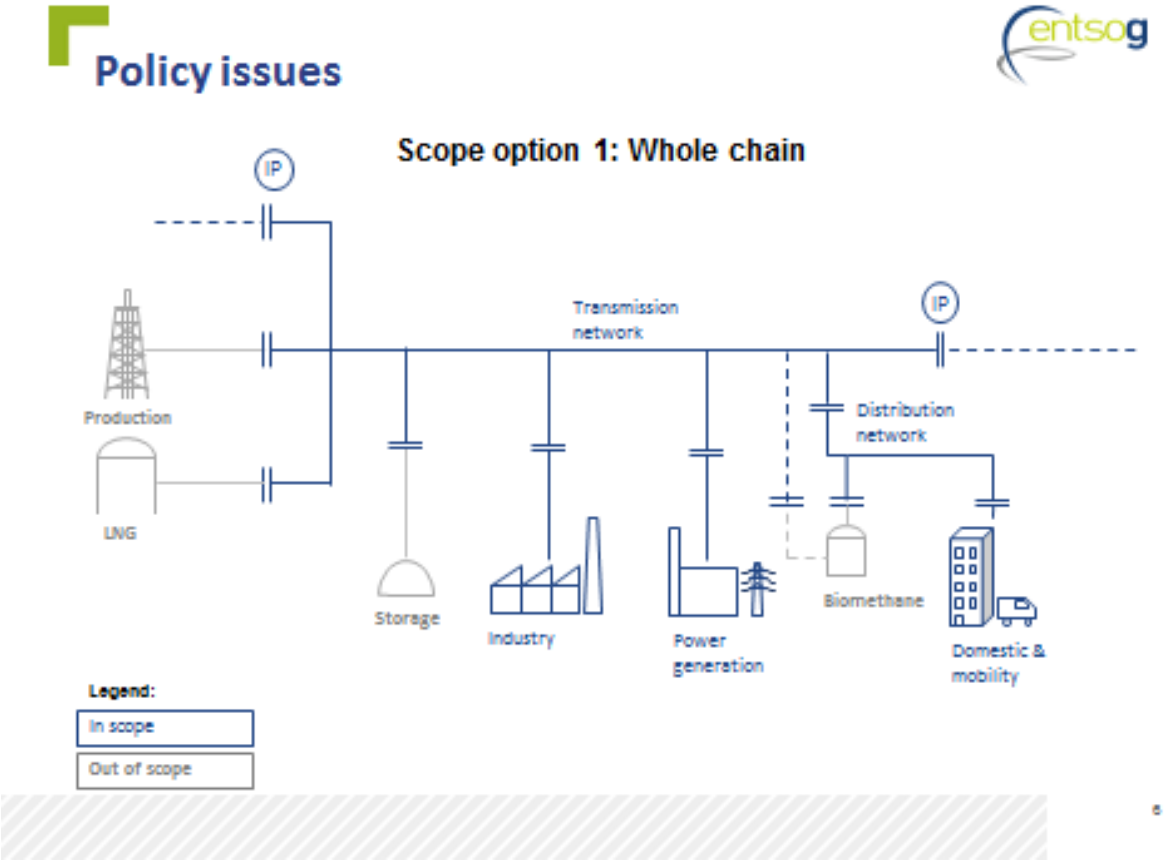
Network operators and concerned parties carry out an impact assessment demonstrating the limit that could be applied with involvement of the relevant national authorities.

20. *What is your opinion on the proposed option?*

From EUTurbines' point of view, a generic limit should not be applied, but rather left it to be discussed on an ad-hoc basis, as it is currently the case.

Section 3: Impact analysis of different scenarios

In terms of the impact of a possible **<u>whole chain</u>** implementation scenario



23. What benefits do you expect?

From the gas turbines manufacturers' perspective, no benefits are expected from this option.

24. What negative impacts might this scenario have?

For gas turbines, this scenario would have important negative impacts in power generation as well as mechanical drive (used in the gas transmission network) and industrial applications. Continuous or unforeseen variations in the composition of the gas that is used by gas turbines will have a negative effect on the performance and reliability of the gas turbine, which can exceed the emissions limits or increase the risks in terms of safety – such as flashbacks and auto-ignition.

25. Are there any barriers to implement it?

There are technological requirements linked to a specified gas quality. Changing the quality of the gas delivered implies the need to adapt the gas turbine – such as the combustor – which has costs implications.

Gas turbine manufacturers are able to design optimised plants for a wide spectrum of defined gas qualities. Variations of the defined quality, however, pose a technological challenge to the gas turbine – not only in terms of performance and delivery but also in terms of emissions and safety.

Another question arising from the situation described above is liability: in the case of power generation, existing contracts have been agreed based on a defined gas quality. Thus, it remains unclear who would cover the costs of the hardware adaptations necessary in this scenario.

26. How much would it cost to overcome them?

It needs to be kept in mind that changes in the gas turbine components would not only apply to new equipment but also to existing installations. Adapting existing equipment to new settings – which again should be then stable – has high costs. While the costs will vary depending on the type and size of the installation, hardware adaptations can be in the range of 10%-20% of the cost for a new engine.

27. How long would it take?

The replacement of hardware parts cannot be done overnight. Also, taking into account that changes in the entire existing installations are needed, the timeframe would be in the long term.

28. Do you foresee any risk in terms of security of supply?

In this scenario, problems caused to gas turbines by varying gas quality can have an impact on not only the security of gas supply but also on the security of electricity as well as heat. These could lead, for instance, to the temporary shut-down of a power plant or interruptions in the gas transmission network.

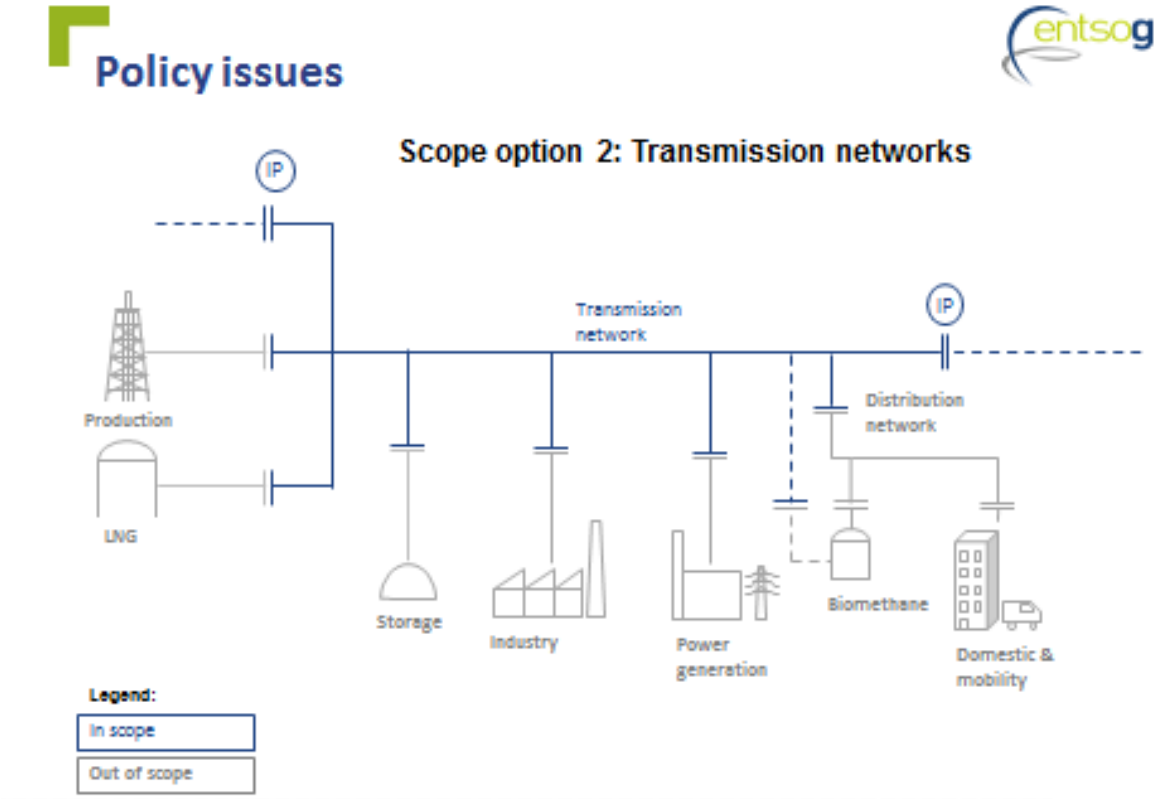
30. Is this given scenario feasible for your segment/organisation/country?

From the reasons outlined above, EUTurbines believes that this scenario would be the least feasible of all.

31. Could there be any unintended consequences?

From the gas turbines manufacturers' point of view, the compliance with emission limits as well as the machinery integrity would be compromised with this scenario.

In terms of the impact of a possible **transmission networks** implementation scenario



32. What benefits do you expect?

From the gas turbines manufacturers' perspective, no real benefits are expected from this scenario either.

33. What negative impacts might this scenario have?

While in this scenario, gas turbines used in power generation and in industrial applications would not be any longer directly impacted, the gas turbines used in the gas transmission network would continue having similar negative impacts as outlined in the "value chain" scenario.

34. Are there any barriers to implement it?

As mentioned in the "value chain" scenario, technological adaptation of some components would again be needed, to adapt the engine to variations in the gas quality as compared to previously defined.

35. How much would it cost to overcome them?

As before, hardware adaptations are costly, and could potentially affect the entire existing gas transmission network infrastructure.

37. Do you foresee any risk in terms of security of supply?

Impacts on the performance of the gas turbine in the gas transmission network due to changes in the gas quality could lead to disruptions in the supply of natural gas.

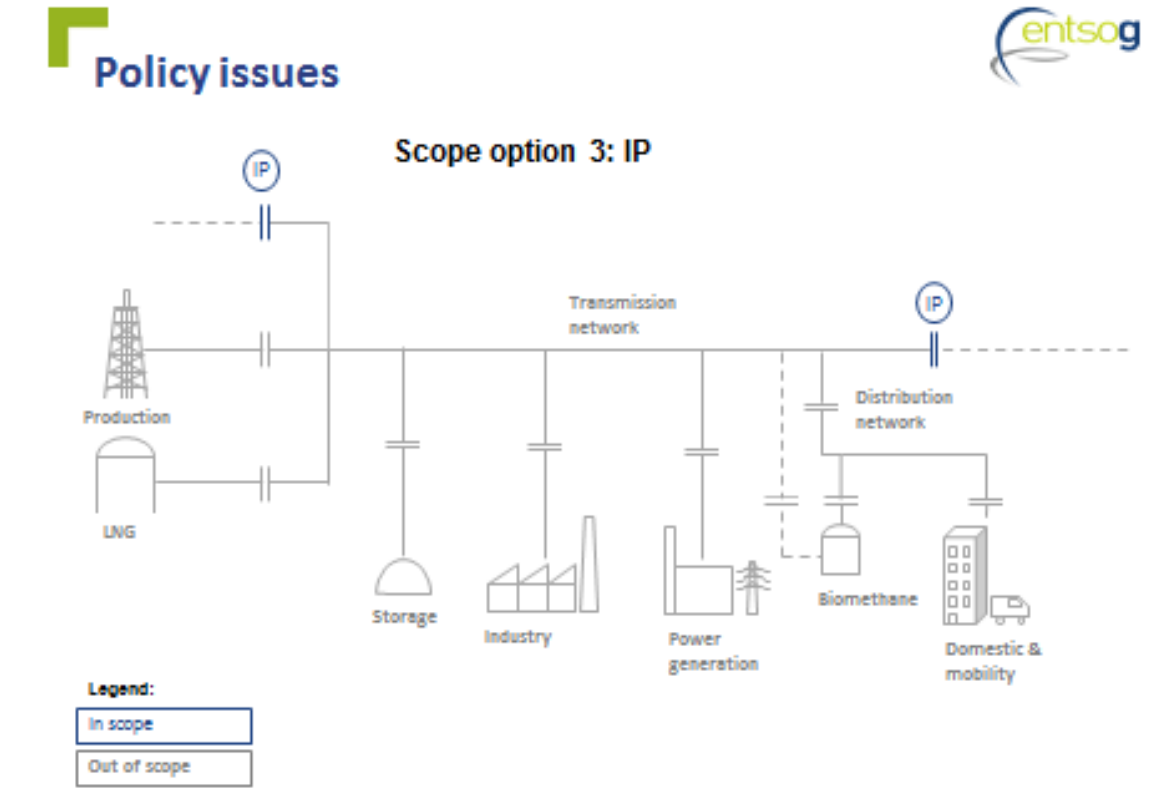
39. Is this given scenario feasible for your segment/organisation/country?

From the reasons outlined above, and as in the case of the "value chain" scenario, this option would not be feasible.

40. Could there be any unintended consequences?

From the gas turbines manufacturers' point of view, the compliance with emission limits as well as the machinery integrity would be compromised with this scenario.

In terms of the impact of a possible implementation at **<u>interconnection points</u>** scenario

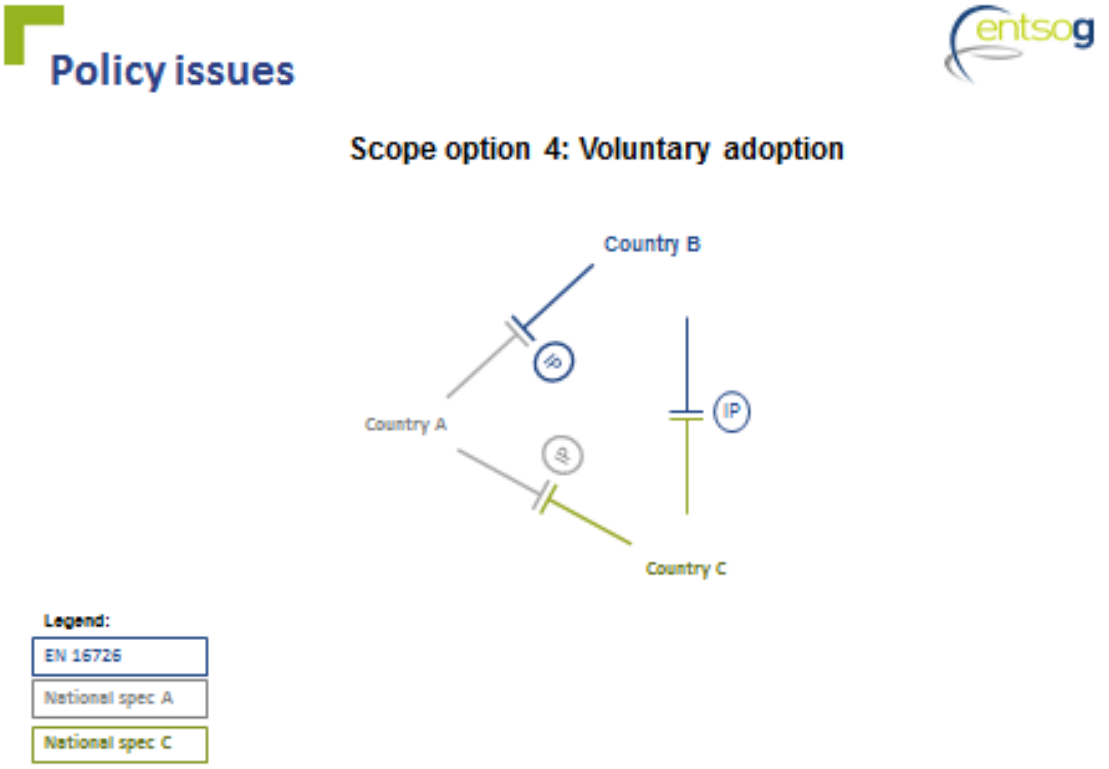


41. What benefits do you expect?

As it is not clear to EUTurbines, how the conformity with the standard would be technically achieved at the interconnecting points without effecting the transmission network. Therefore, the influence on (at least part of) the transmission network and existing gas turbines installed within it cannot be assessed. There might be a negative impact, when it is not assured that the gas properties at a certain location would remain as they had been defined before (see scenarios above).

In the case of new installations, the equipment would be adapted to the known requirements, which would then be stable in a given network, thus, not needing further technological adaptations afterwards.

In terms of the impact of a possible **voluntary adoption** scenario



42. What benefits do you expect?

With this scenario, the existing installed infrastructure would not be impacted. At the same time, it would allow addressing specific challenges/barriers in specific segments on an ad-hoc basis.

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

From the gas turbines manufacturers' point of view, this is the best scenario.

Existing installations should be able to continue operating with the gas quality they were designed and optimised for. Currently, defined gas compositions differ in different regions of Europe. Hence, regional differences should continue to be possible in the future.