European Legislative and Regulatory Framework on Power-to-Gas

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Power-to-Gas provides a number of system services. However, so far, there is no regulatory framework that addresses the environmental impact of Power-to-X products. Green PtX products are more expensive to produce than fossil fuels and have to compete with fossil fuels in the same market despite this. In order to achieve a (pareto)-optimal market situation in the event of market distortion the economic theory requires regulation. Since consumers can’t distinguish between fossil fuels and PtX products, measures in the area of market and regulation are necessary to enhance the competitiveness of PtX products in the market, because if consumers don’t want to pay for Power-to-X products there will never be a substantial Power-to-X industry.

Legal classification of Power-to-Gas

- Electricity Consumer
  - Yes
  - Switzerland
  - Germany
  - Austria
  - No
  - Netherlands
- Energy Storage
  - Yes
  - Austria
  - Germany
- Gas Production
  - Yes
  - Switzerland
  - Germany
- Final consumer Power-to-Gas?
  - Yes
  - Switzerland
  - No
  - Germany
- Final consumer Power-to-Gas-to-Power?
  - Yes
  - Switzerland
  - No
  - Germany

Exemption from network tariffs for Power-to-Gas (without reconversion)?

- Yes
  - Germany
  - Switzerland
- No
  - Austria

Who is allowed to operate a Power-to-Gas plant?

- Energy Storage
  - A producer may store energy.
  - Transmission system operators are not allowed to own, develop, manage or operate energy storage facilities.
  - Electricity Distribution system operators shall not own, develop, manage or operate energy storage facilities.
  - The Electricity Directive 2009 provides for an exception, subject to certain conditions. If these conditions are fulfilled, Member States may allow transmission and/or distribution system operators to own energy storage facilities.

- Gas Production
  - A producer may produce gas.
  - Ownership and operation of gas networks need to be unbundled from production.
  - Gas storage needs to be legally unbundled from production and supply.
  - Gas TSO
  - Gas DSO

- Electricity TSO
  - No

- Electricity DSO
  - Yes

Conditions for feed-in of SNG

- No harmonised hydrogen limit!

Support schemes

- Renewable Energy in the transport sector
  - Renewable energy within the final consumption of energy in the transport sector should be at least 14% by 2030.
  - Share of renewable electricity shall be considered to be four times its energy content when supplied to road vehicles.
  - Where electricity is used for the production of renewable liquid and gaseous transport fuels of non-biological origin, the average share of electricity from renewable sources shall be used to determine the share of renewable energy.
  - It may fully be counted as renewable electricity when obtained from direct connection to an installation.
  - It may be counted as fully renewable when taken from the grid provided that it is exclusively produced from renewable sources (and the renewable properties have been demonstrated).

Guarantees of Origin

- Guarantee of origin means an electronic document which has the sole function of providing evidence to a final customer that a given share or quantity of energy was produced from renewable sources.
- The establishment of a system of guarantees of origin on a national basis is necessary, in particular in accordance with rules at EU level to facilitate (cross-border) trade in gases from renewable sources.
- According to Renewable Energy Directive 2018 Member States shall ensure that the origin of energy from renewable sources (amongst others renewable gas, including hydrogen) can be guaranteed.

References

Fig. 1: Composition of the electricity price in Germany
Fig. 2: Hydrogen limits

Acknowledgement

The support of this work under the Horizon 2020 research project "STOREandGO" on behalf of the European Union (contract # 732779) and by the association Energy Institute at the Johannes Kepler University is gratefully acknowledged.