

# Power to Methanol = Liquid Electricity

DG ENER, Brussels  
9th November 2015

# Situation Germany

Switched off renewable power

Figures for 2015 (prognosis)

**Conventional Power consumption**

TWh approx.

354

**Net export**

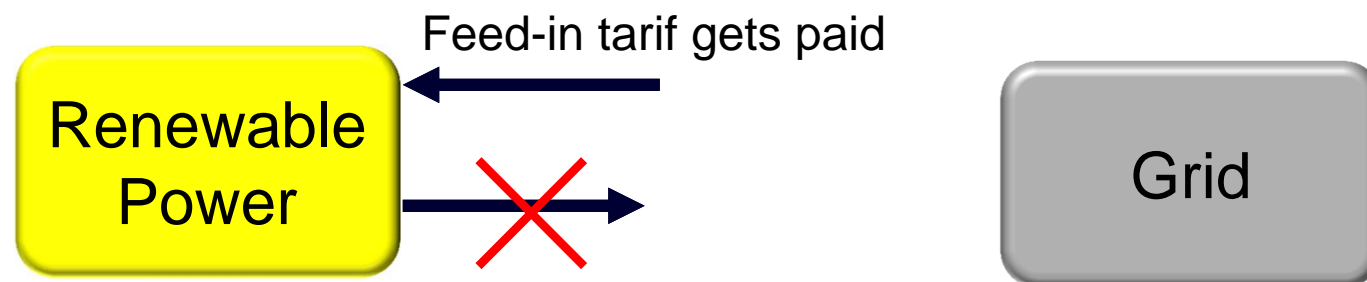
33

**Renewable Power production**

157

**Switch off Renewable Power capacity with Feed-in tariff**

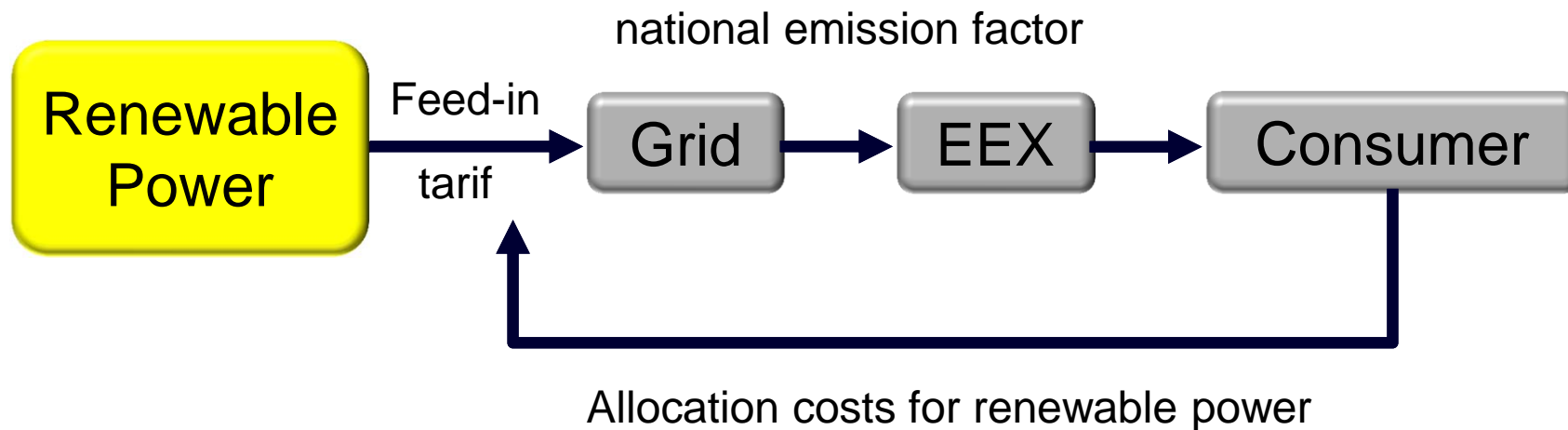
(6,5)



4% Renewable Power capacity get switched off,  
while feed-in tariff is paid for.

# Situation Germany

Consumer finance the allocation costs for feed-in tariff.



# Renewable Energy Directive (2009/30) & Fuel Quality Directive (2009/28)

The amended FQD and RED introduce RED-Annex IX advanced fuels and feedstocks:

- |   |                       |
|---|-----------------------|
| (a) renewable liquid and gaseous fuels of non-biological origin | <b>Power to X</b>     |
| (b) carbon capture and utilization for transport purposes       | <b>Carbon to fuel</b> |

## Power to X and Carbon to fuel is there

The emission intensity of needed power is emission intensity of the national grid -

Then PtX is not a sustainable product and is not a recognized product

Or

Power is supplied by a renewable energy production with no grid connection -

then PtX is not in sufficient production

In contradiction to Annex IX is Article 15 RED, where the energy supplier is allowed to supply renewable power with guarantees of origin.

# Regulation to reduce CO<sub>2</sub> emissions from new passenger cars (333/2014)

In 2021 manufacturer of cars must comply with the threshold of 95 gCO<sub>2</sub>/km for their sold car fleet. Basis for calculation is the actual GHG-emission of the used fuel. Fuels with GHG-savings from life-cycle assessment don't have a legal impact on the fleet mix. Three major exceptions are:

- Emission innovative technology packages, which shall be used to reduce the specific emission target of a manufacturer up to 7 gCO<sub>2</sub>/km.
- Alternative fuel vehicle (a vehicle designed to be capable of running on at least one type of fuel that is either gaseous at atmospheric temperature and pressure, or substantially non-mineral oil derived) ← **Not implemented for Power-to-X**
- The definition for electrical vehicle is zero CO<sub>2</sub> Emissions

**Power to liquids is not recognized**

# Directive on internal market in electricity (2009/72)

The liberalization of the electricity market aims a Europe-wide competition in the electricity production or their resale and import. Therefore the separation between Producer, Transmitter and Supplier is implemented.

With the foundation of European Network of Transmission System Operators for Electricity (Entso-e) and the International Grid control Cooperation (IGCC) the market is liberalized, but not implemented in the infrastructure.

**With the missing grid infrastructure  
large scale energy storage is needed**

According to the Emission trade system the export from Power between the Member states is CO<sub>2</sub>-free power supply for the national balance.

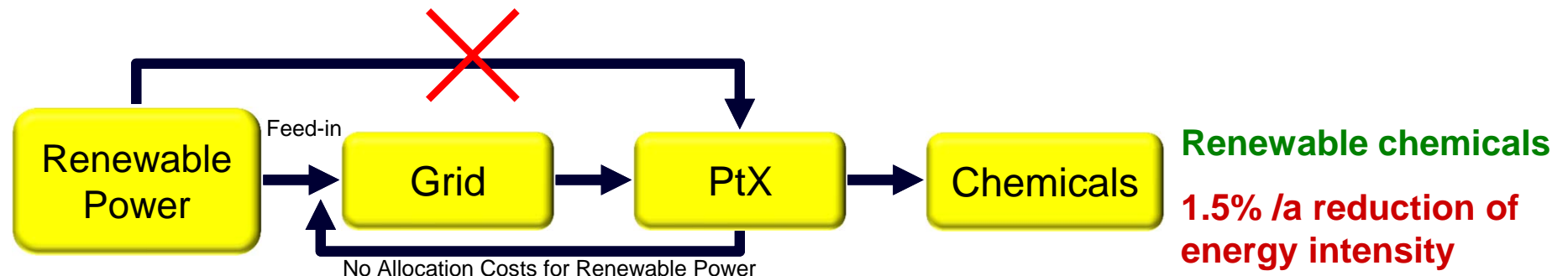
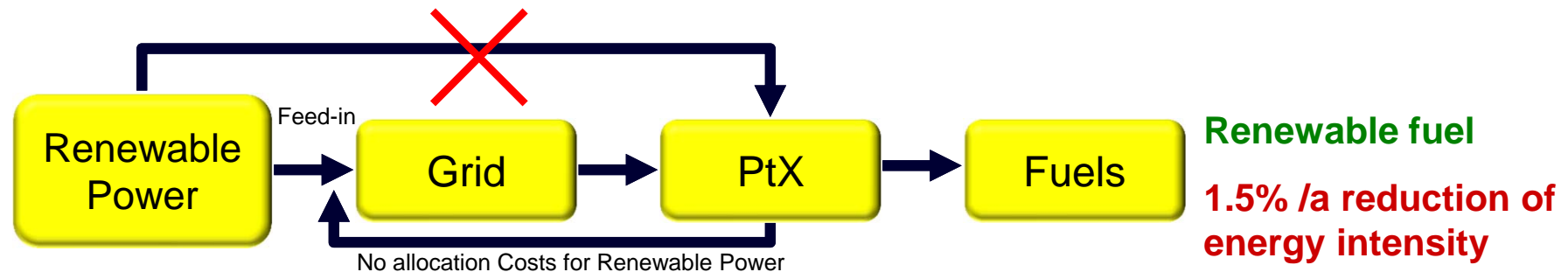
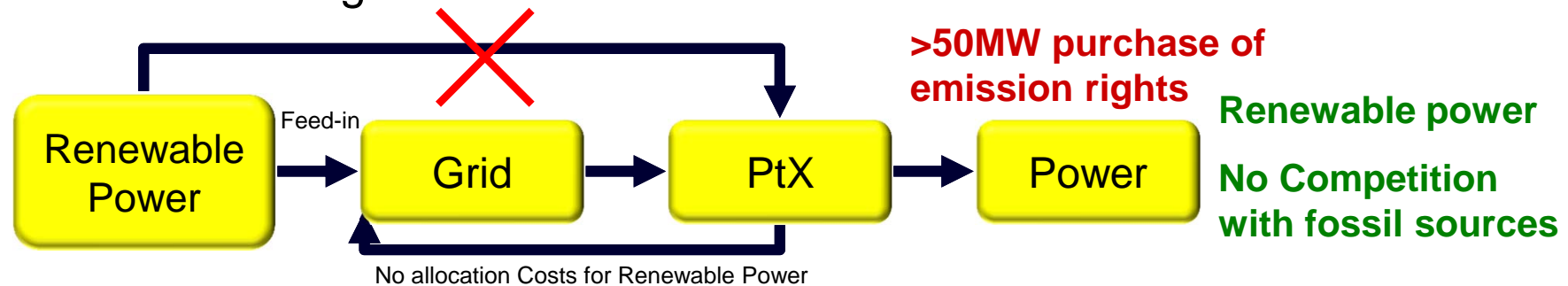
With the production of *e-fuel* power can be stored and power exports, which are disadvantageous in the national CO<sub>2</sub> balance, can be prevented and fossil fuel imports can be replaced.

# Next step Renewable Energy Directive & Fuel Quality Directive

- 2017 Default values for Power-to-X
- Definition Framework targets for renewable Energy and Carbon Dioxide post 2020 strategy
- Implementation of Power-to-X in Member states
- Definition of alternative fuel targets on Member states level

# Requirement PtX from system

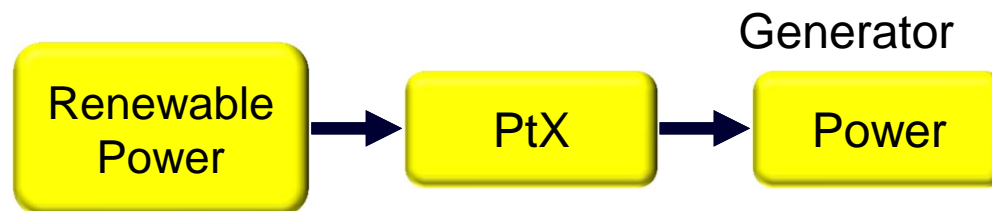
Connection to grid





# Situation PtX

No Grid Connection according ANNEX V C. 11 RED and ANNEX IV. C. 11 FQD



**Feed-in tariff**



**Advanced fuel competes with feed-in tariff**



**Advanced chemicals compete with fossil chemicals and feed-in tariff**

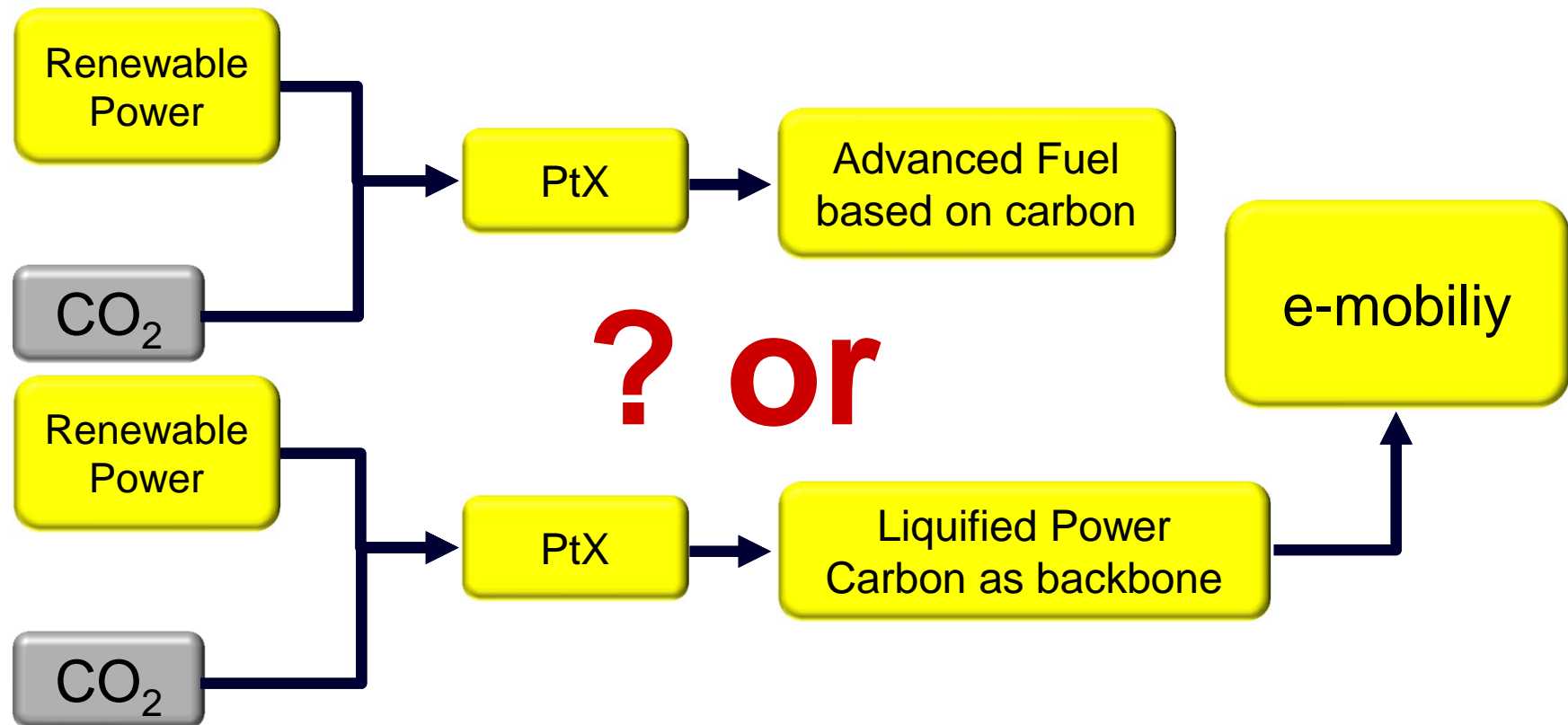
# Conclusion

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- Oversupply of renewable power produced on different locations is not usable for Power-to-X plant;
- Oversupply of renewable power taken from the power grid is not renewable;
- Chemical energy storage is not usable in fuel or chemical sector to reduce petrol imports for fuel and chemical use;
- Chemical energy storage is competing against feed-in tariff for renewable power;
- Chemical energy storage is not able to receive the grid infrastructure for increasing transmission of renewable power.

# Questions for way out

#1 PtX = liquified power?



The Energy contend is based on power and not CO<sub>2</sub>!

# Questions for way out

## #2 Grid connection

- How to bring renewable power through the grid to the PtX plant?
- What is the default value of PtX?

PtX producer are final customers according to Article 19 RED. Hence Guarantees of Origin can be use for Grid Connection according ANNEX V C. 11 RED and ANNEX IV. C. 11 FQD.

# **bse** Engineering Leipzig GmbH

Thank you for your attention!

**Christian Schweitzer**

Mottelerstrasse 8  
04155 Leipzig, Germany

phone +49 341 609 12 0  
fax +49 341 609 12 15  
email [office@bse-engineering.eu](mailto:office@bse-engineering.eu)  
web [www.bse-engineering.de](http://www.bse-engineering.de)

