

Legal and Regulatory Framework



Dr. Markus Schreiber

- I. Storage Systems and the law**
- II. The European approach and context**
- III. The German national legal framework**
- IV. Standards and codes for grid injection**
- V. Look abroad**
- VI. Outlook and proposals**

I. Storage Systems and the Law: An Overview

I. Storage systems and the law

- Special status of the energy industry
- High degree of regulation
- Clearly defined roles for different market participants
 - E.g., producers, grid operators, consumers
- Problem: Storage systems combine characteristics of several of these roles
→ «hybrid character»

I. Storage systems and the law

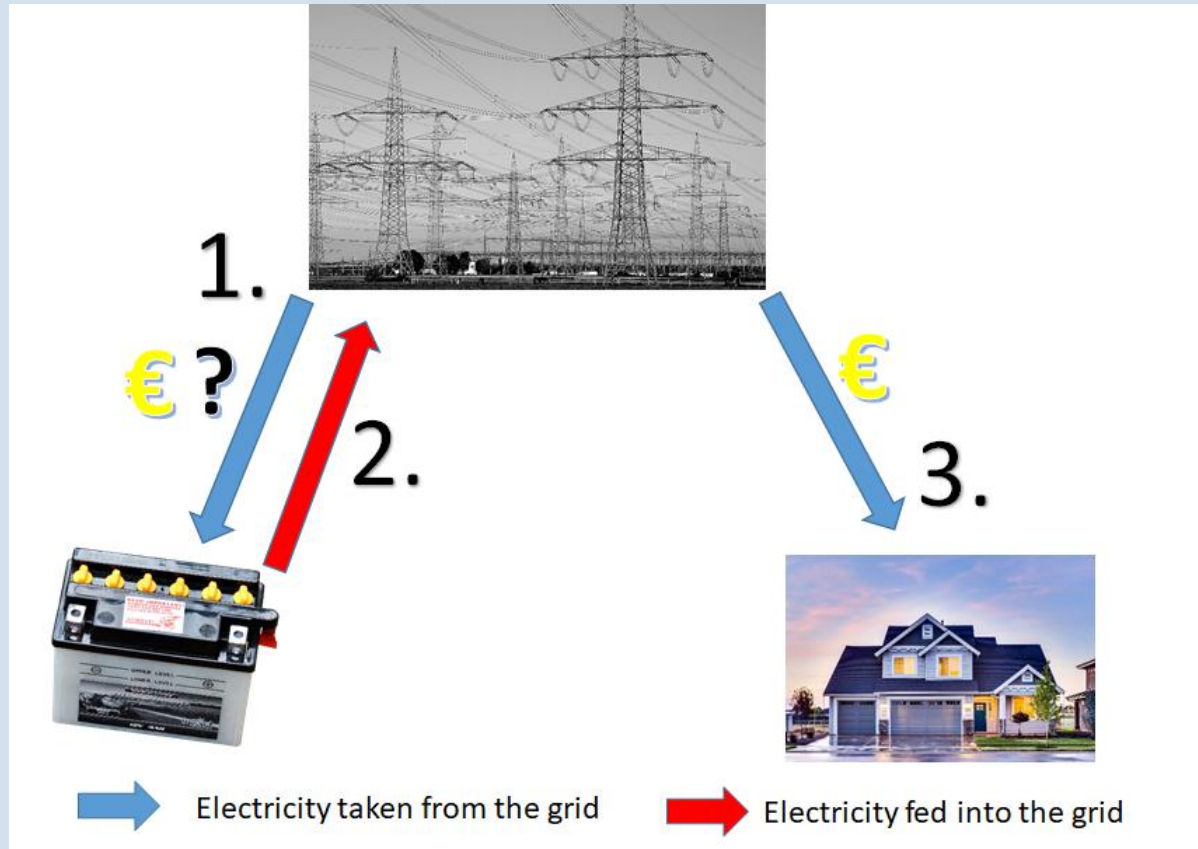
- Storage of electricity = final consumption?
- Feed-in of electricity = production?
- Storage systems part of the grid infrastructure?



I. Storage systems and the law

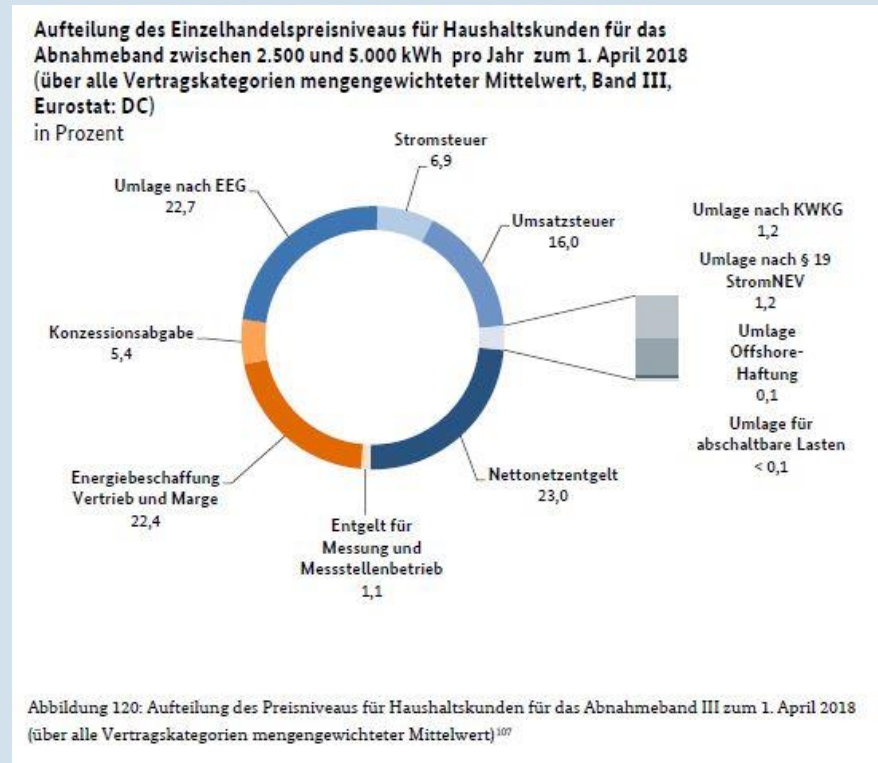
- Result: When there is no special definition of storage systems, it is hard to say which rules they fall under
- Most problematic issue: Do storage systems have to pay grid fees?
- Some argue this would be unfair («double burden»)

I. Storage systems and the law



I. Storage systems and the law

- Relevance of grid fees and other burdens for final consumers*



*Bundesnetzagentur 2018

II. The European approach and context

II. The European approach and context

1. Electricity Internal Market Directive (EU) 2019/944

Quick introduction on EU Directives:

- Unlike EU Regulations, they are generally not directly applicable law
- However, they are binding on the EU member states as to their goals
 - Member states must implement their content into their national law
 - Significant room for individual solutions by member states
 - Basic framework (and terminology!) governed by the Directive

Terminology, Art. 2

No. 3: *'final customer'* means a customer who purchases electricity for own use

No. 38: *'producer'* means a natural or legal person who generates electricity

No. 59: *'energy storage'* means, in the electricity system, deferring the final use of electricity to a moment later than when it was generated, or the conversion of electrical energy into a form of energy which can be stored, the storing of such energy, and the subsequent reconversion of such energy into electrical energy or use as another energy carrier;

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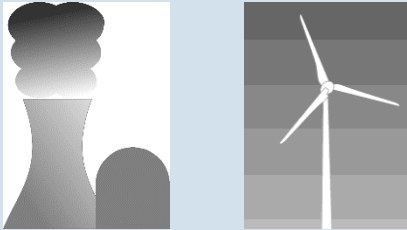
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No. 60: *'energy storage facility'* means, in the electricity system, a facility where energy storage occurs.

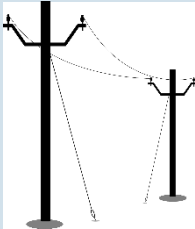
II. The European approach and context

Unbundling:

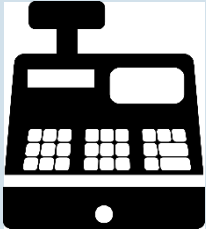
Production



Transmission/
Distribution

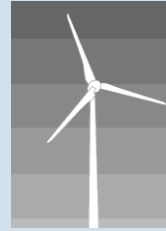
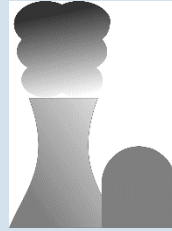


Supply/Sale

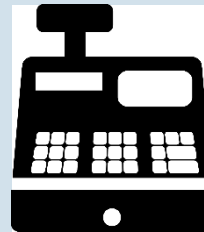
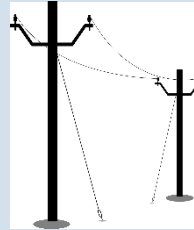


Vertically integrated
energy utility

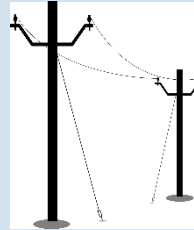
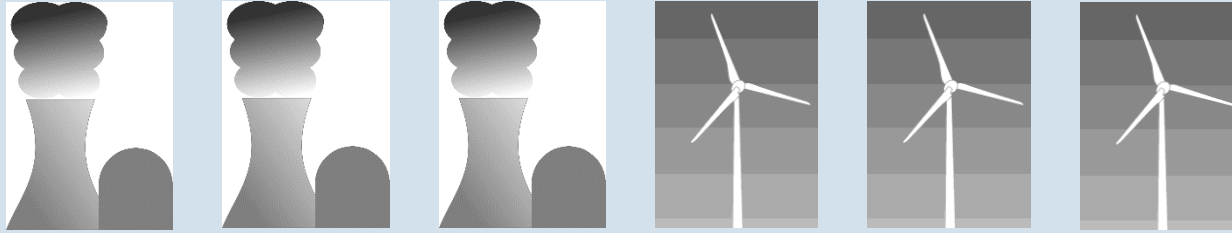
II. The European approach and context



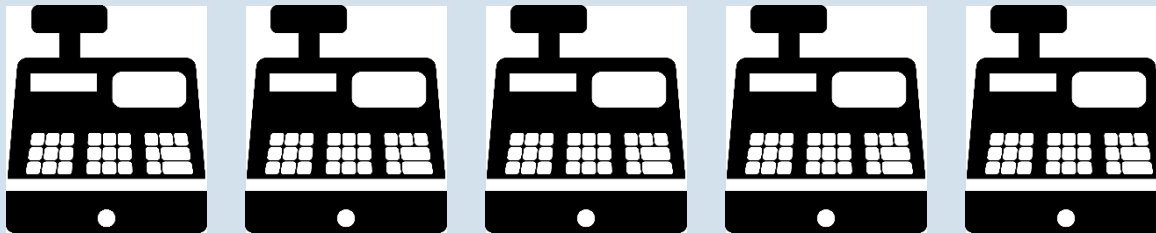
Unbundling



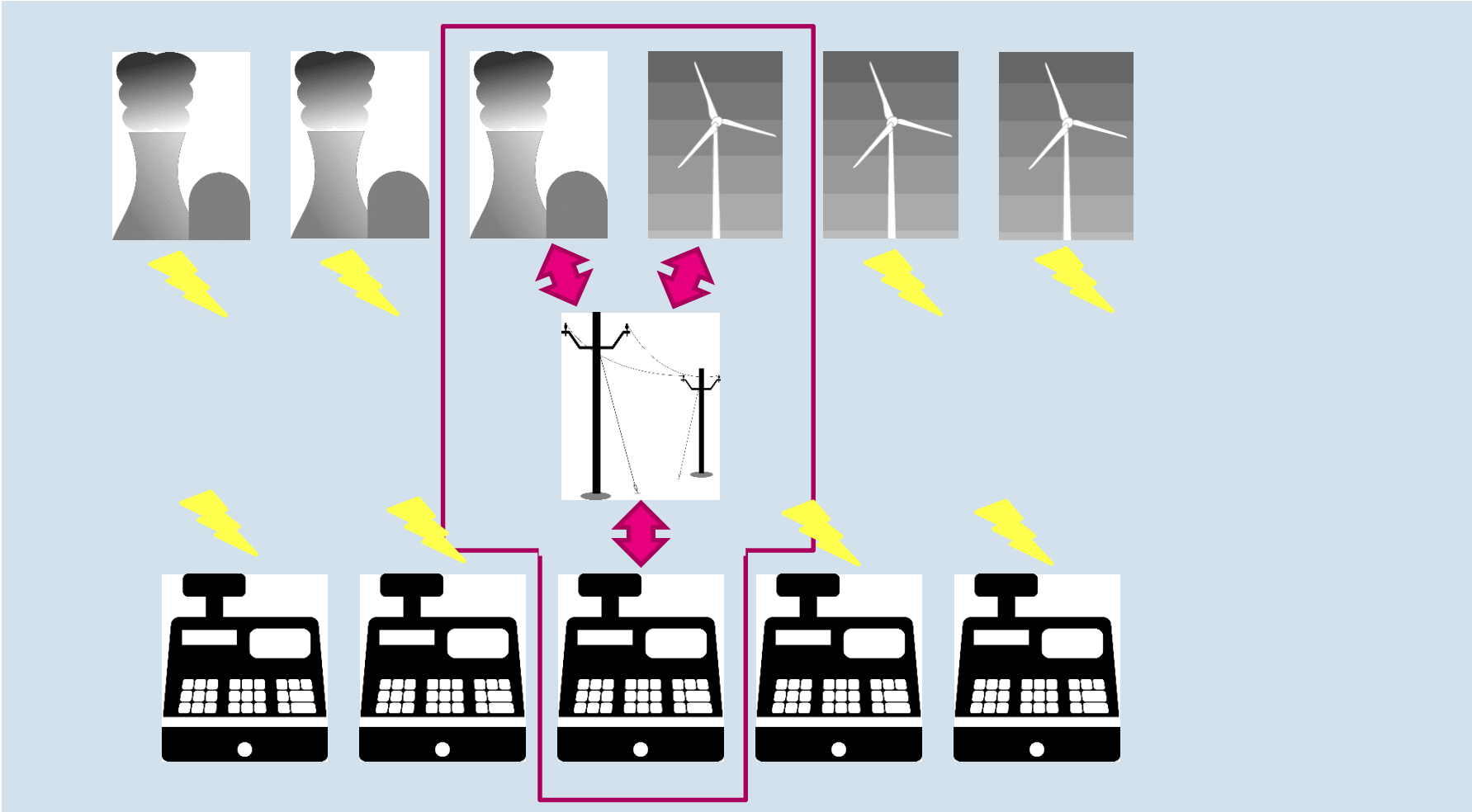
II. The European approach and context



natural
monopoly



II. The European approach and context



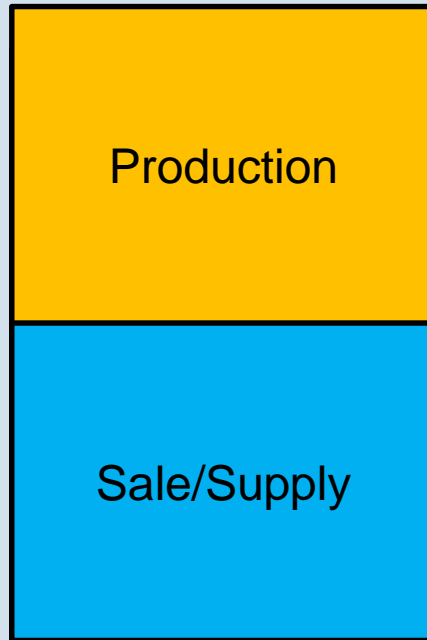
II. The European approach and context

Types of unbundling:

- Ownership unbundling
 - Legal Unbundling
 - Financial (reporting) unbundling
 - Operational unbundling
 - ISO model
 - ITO model
- } Transmission

II. The European approach and context

Ownership unbundling



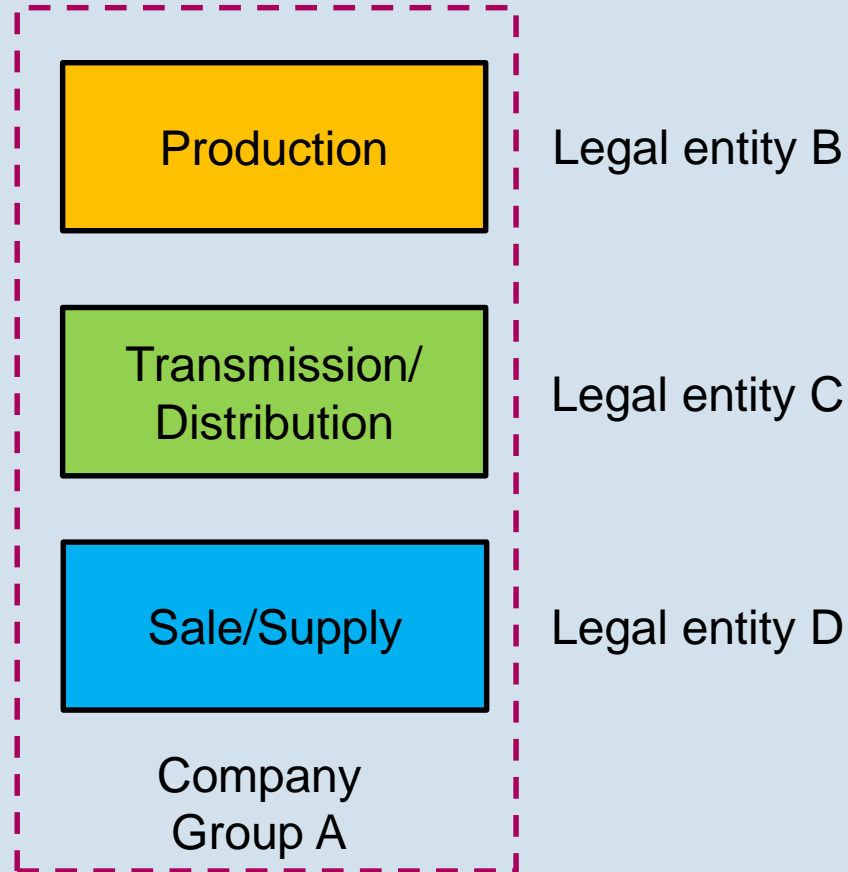
Company A



Company B

II. The European approach and context

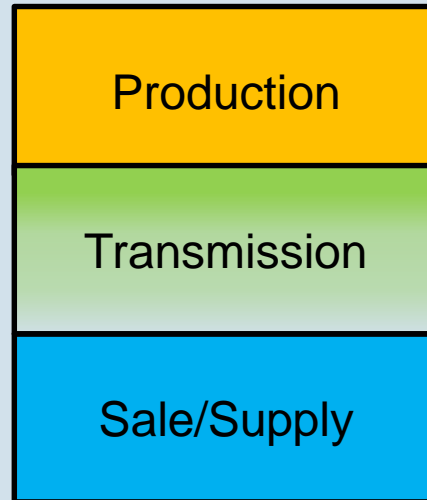
Legal unbundling



II. The European approach and context

ISO Model

ownership



Company A

operation



Company B

II. The European approach and context

ITO Model

Legal entity B



Legal entity C



Legal entity D



Company
Group A

Behavioral and structural criteria

Independent decision-making

Sufficient means, including own offices

Independence of personnel

...

- Differentiation between transmission and distribution
- Distribution: legal/financial unbundling sufficient
- Transmission: Ownership unbundling as goal, however, ISO/TSO models allowed

Ownership of energy storage facilities by distribution system operators

- Basic principle: No ownership or operation of electricity storage by DSOs and TSOs, Art. 36 and 54
- Exemption: If granted by member state and regulatory agency upon review if
 - “fully integrated network component” – FINC

or

- no other parties were able to provide sufficient storage capacity in auction and
- the storage facility is necessary to fulfil the DSO/TSO’s duties
- not used to buy or sell electricity in the electricity markets
- “The regulatory authority may draw up guidelines or procurement clauses to help [distribution/transmission] system operators ensure a fair tendering procedure”

II. The European approach and context

FINC, Art. 2 No. 51:

“network components that are integrated in the transmission or distribution system, including storage facilities, and that are used for the **sole purpose of ensuring a secure and reliable operation** of the transmission or distribution system, and **not for balancing or congestion management**”

II. The European approach and context

- Regulatory agencies must monitor the market at least every five years to establish need for storage ownership by grid operators
- If need no longer exists, storage assets must be phased out
- Does not apply to FINC

II. The European approach and context

- Art. 15 Active customers

“5. Member States shall ensure that active customers that own an energy storage facility:

[...]

(b) are not subject to any double charges, including network charges, for stored electricity remaining within their premises or when providing flexibility services to system operators;”

II. The European approach and context

- Art. 2 No. 8

*“active customer” means a final customer, or a group of jointly acting final customers, who consumes or stores electricity **generated within its premises** located within confined boundaries **or, where permitted by a Member State, within other premises**, or who sells self-generated electricity or participates in flexibility or energy efficiency schemes, **provided that those activities do not constitute its primary commercial or professional activity”***

→ Very narrow

II. The European approach and context

- Overall result:
- Storage definition
- Very complex rule on unbundling
- Very narrow rule on double burden

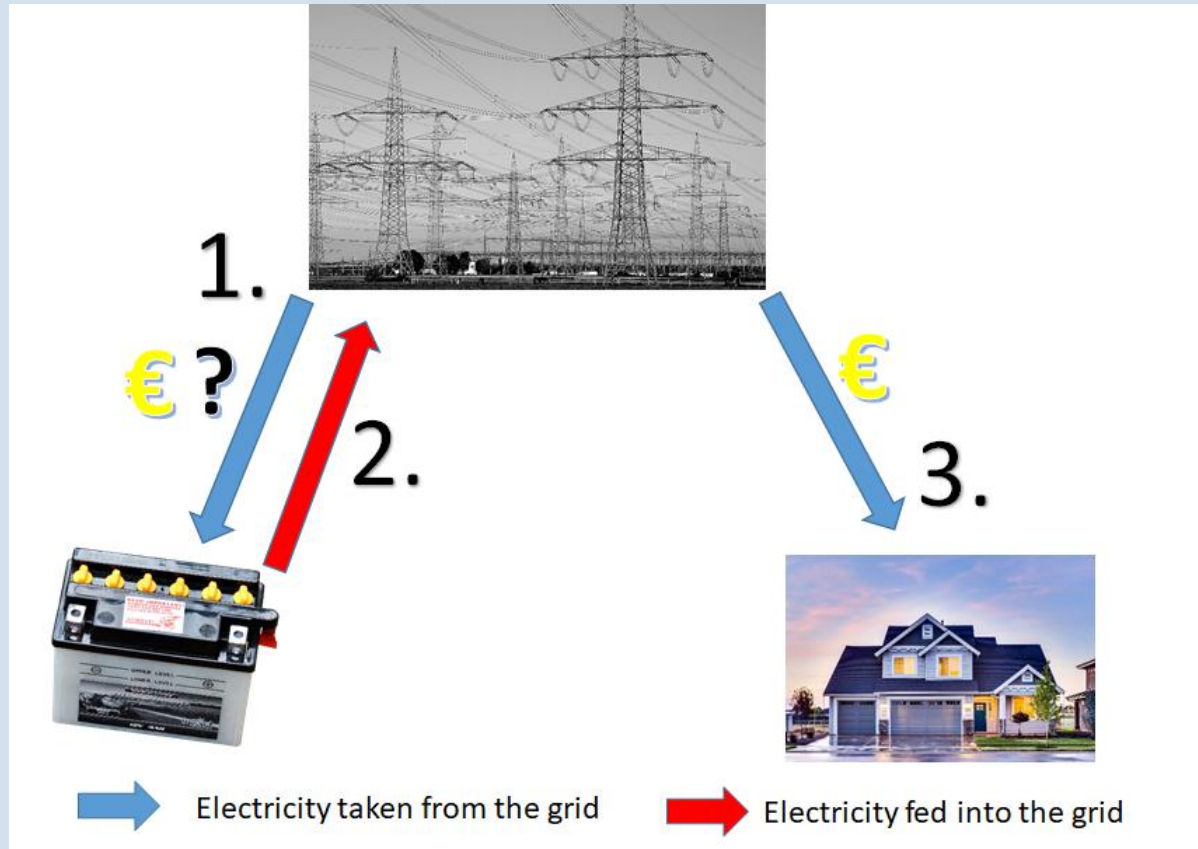
III. The German national legal framework

1. Grid fees

a) Overview

- As in most countries, grid fees paid by final consumers
 - Paid as part of the overall electricity tariff
- Therefore, if storage systems were to be regarded as final consumers, they would have to pay grid fees for any electricity they procure from the public grid
- Once the electricity is fed back into the grid and consumed by some other final consumer, grid fees would again have to be paid

I. Storage systems and the law



b) Relevant legal provisions

§ 3 No. 25 Energy Industry Act (EnWG):

Final Consumer: Natural or legal persons that buy energy for their own consumption [...]

§ 3 No. 28 EnWG:

Grid user: Natural or legal persons that feed energy into an electricity or gas supply grid or obtain energy from it

§ 3 No. 31 EnWG:

Storage facility: A facility owned or operated by a gas supply company to store gas [...]

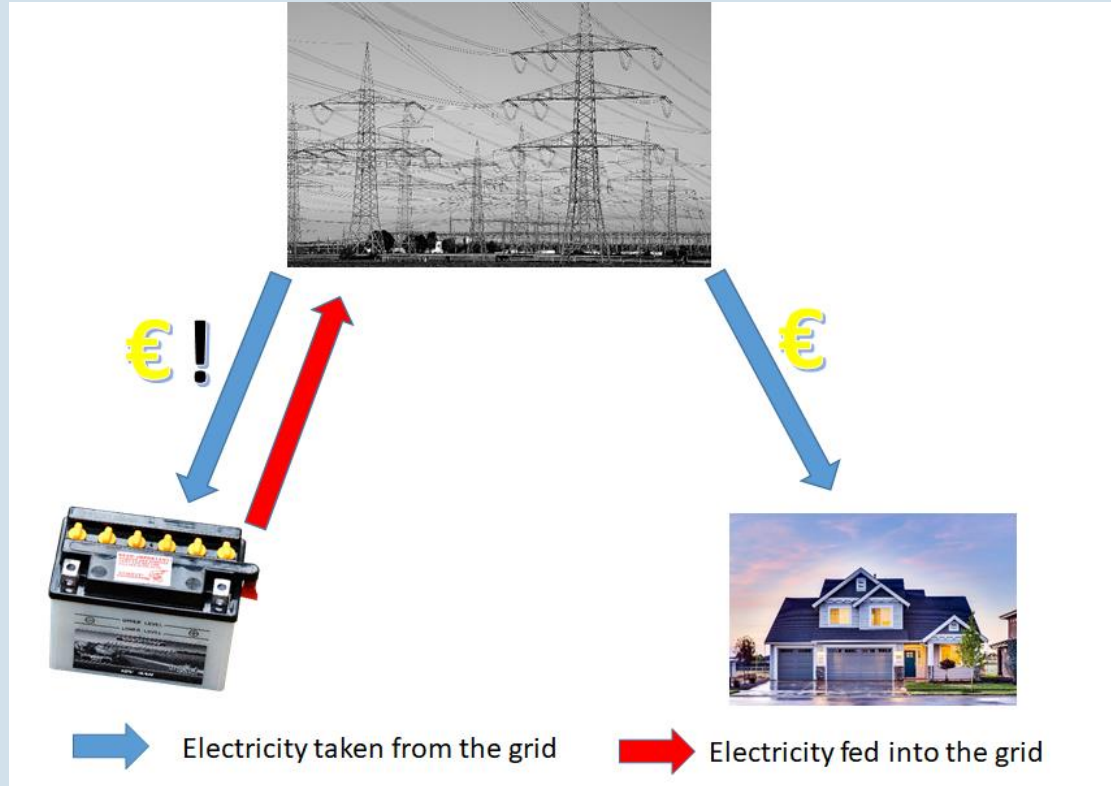
c) Electricity storage from the grid as «final consumption»?

- Arg. contra: Electricity only temporarily stored, in order to be fed back into the grid
 - would only apply to storage systems that actually feed electricity back
- Arg. pro: Most storage systems store electrical energy by converting it
 - not different from the conversion of electrical energy into any other usable form (heat, kinetic energy, etc.)
 - energy is never truly «consumed»

III. The German national legal framework

- Federal Court of Justice (BGH) decision of 2009, EnVR 56/08: Pump storage power plants are final consumers when they obtain electricity from the public grid
 - Main argument: Electrical energy is first «fully consumed» before it is later again converted to electrical energy
- The German literature overwhelmingly assumes that this precedent is also applicable to other storage systems that convert energy
 - such storage systems would generally have to pay grid fees as well as the special fee for the renewable energy support schemes, electricity taxes etc.

III. The German national legal framework

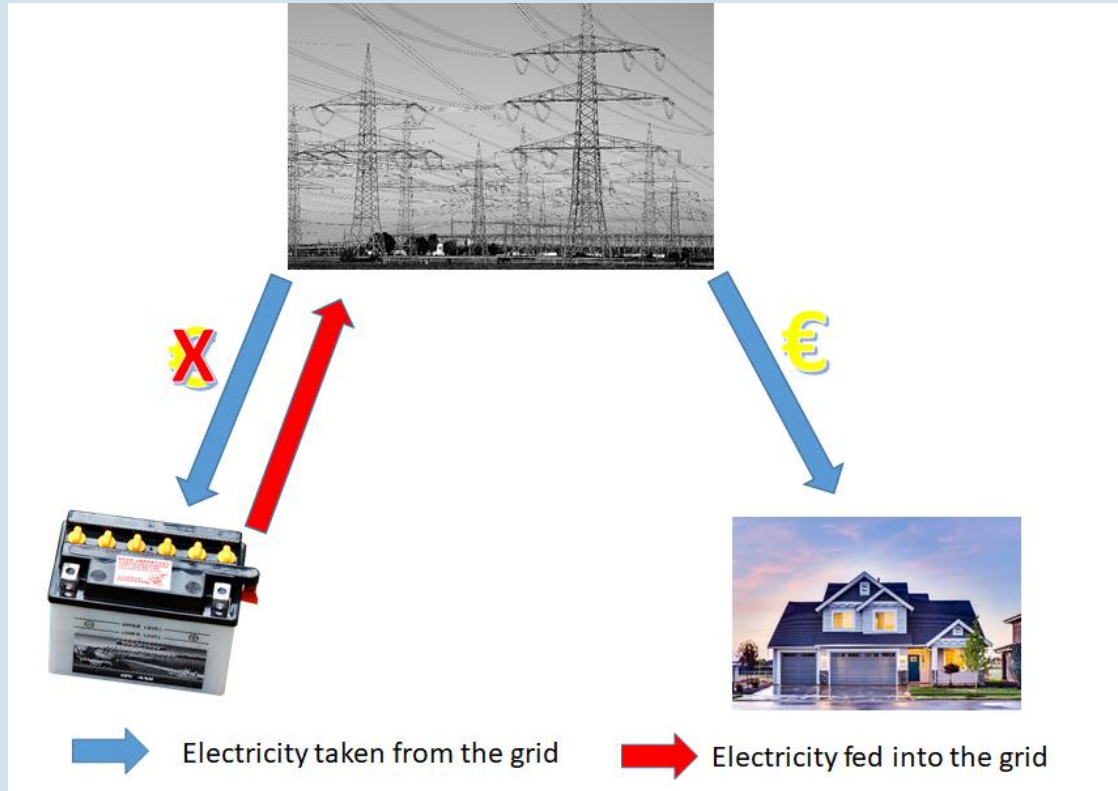


d) Specific rules for storage systems

§ 118 para. 6 EnWG:

- *For certain new **energy storage installations exemption from grid fees** for a period of 20 years from the date of commissioning. [... (sentence 2 on pump storage)].*
- *Usually only when electricity is **fed back into the same network** with a time delay.*
- *This requirement **does not apply** to “plants in which hydrogen is produced by **water electrolysis** or in which gas or biogas has been produced by hydrogen produced by **water electrolysis and subsequent methanisation.**”*
- *Problem: Does not extend to all fees (BGH EnVR 24/16)*

III. The German national legal framework

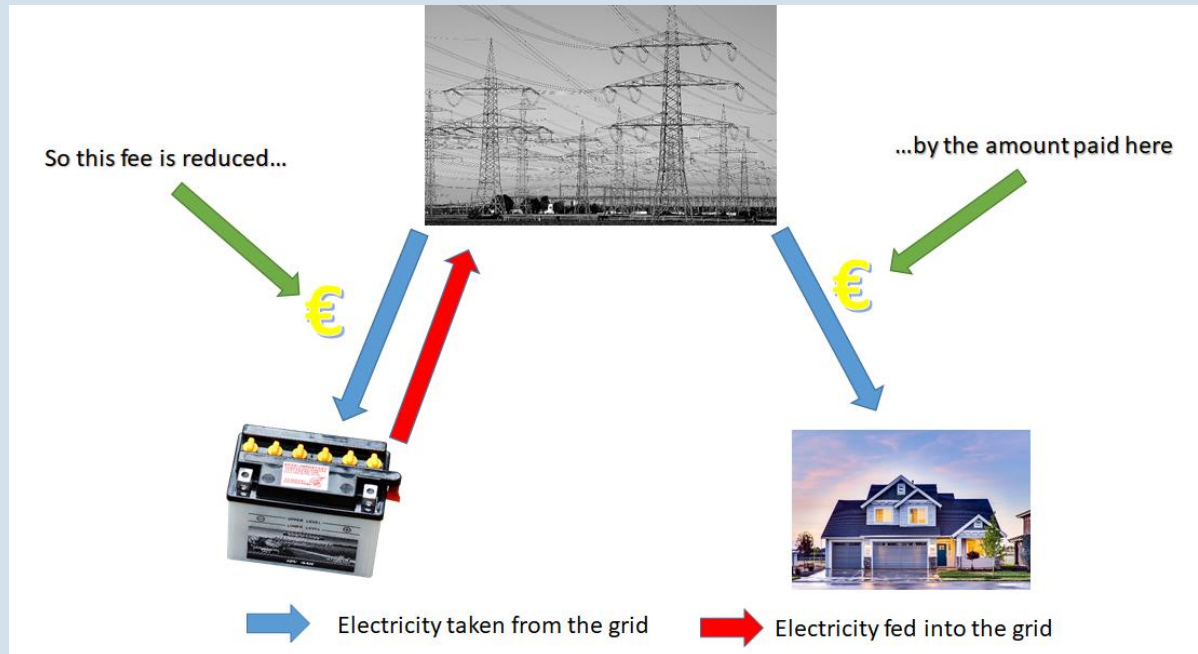


2. Fees to finance the support schemes for renewable energy (EEG levy):

§ 61I Renewable Energy Act (EEG):

*For electricity consumed [...] for the purpose of intermediate storage in an electrical, chemical, mechanical or physical storage facility, the entitlement to payment of the EEG levy [...] shall be reduced to the amount and to the extent to which the EEG levy is paid for electricity **generated with the storage facility**, but to zero at most. [...] The obligation to pay the EEG levy shall not apply to electricity consumed for the purpose of intermediate storage in an electrical, chemical, mechanical or physical electricity storage facility if the energy stored in the electricity storage facility is not withdrawn again (storage loss). [...]*

III. The German national legal framework



But what about P2G-applications that do not feed electricity back into the grid?

- *Power-to-vehicle*
- *Injection into natural gas grid*
- *Use in the industry*

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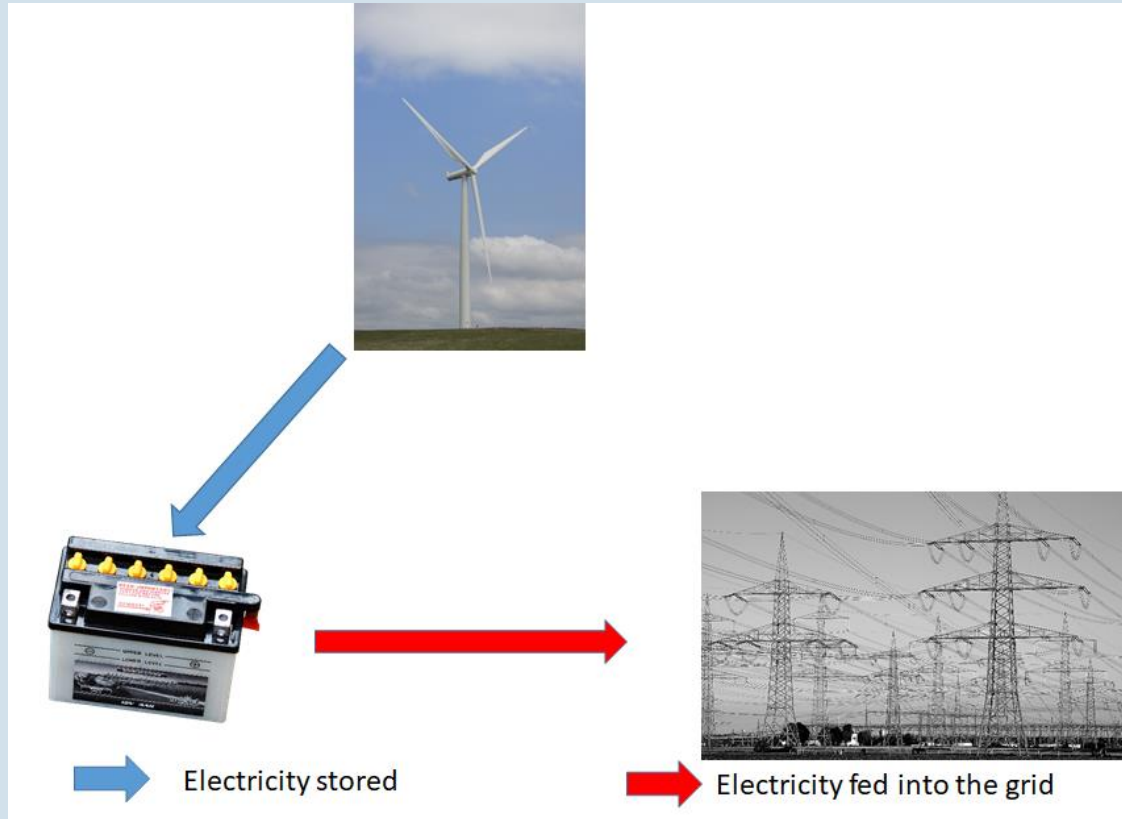
New para. 2:

No levy on electricity that is used to produce storage gases, when injected into gas grid

3. Renewable energy feed-in tariffs, § 19 subsection 3 EEG:

*The right [to receive feed-in tariffs/market premiums] **shall also apply if the electricity has been temporarily stored before being fed into a grid.** In this case, the claim shall relate to the quantity of electricity fed into the grid from the storage facility. The amount of the claim per kilowatt-hour fed into the grid shall be determined by the amount of the claim **that would have existed if the electricity had been fed into the grid without intermediate storage.** The entitlement [to the support payments] shall also apply in the case of mixed use with storage gases.
[...]*

III. The German national legal framework



4. Electricity/gas grid connection, § 17 subsection 1 EnWG:

*Operators of energy supply grids shall connect **final consumers**, electricity and gas supply networks and lines, charging points for electric vehicles, **production and storage facilities and electrical energy storage facilities** to their networks on technical and economic terms and conditions which are reasonable, non-discriminatory, transparent [...].*

- Final consumers
- Production facilities
- Electrical energy storage facilities

a) Final Consumers

- See discussion above
- Wording of § 17 EnWG no argument against final consumer characteristic
 - Cf. charging points for EVs (§ 3 No. 25 EnWG)

b) Production facility

- If P2G-plant feeds electricity back into the grid
- However, some argue that no additional energy produced
- But how about pump hydro storage?
 - Unclear in Germany; considered production facility in Austria
- Feed-in of electricity at the same or some other location?
 - If the latter, only the facility that feeds in could be producer

c) electrical energy storage facility

- Again: not the same as «storage facility» (gas)
- P2G as electrical energy storage facility?
 - Not defined in the EnWG
 - Only if feed-in of electricity?
 - Only if feed-in at the same location?
 - Otherwise gas power plant as electrical energy storage facility?
 - How about «mere» production of gas for other uses?
 - Is there even «storage» involved?

5. Electricity grid access, **§ 20 subsection 1 EnWG**:

Operators of energy supply grids shall grant non-discriminatory network access to everyone according to objectively justified criteria [...]

→ No problem, no matter which definition P2G systems fall under

6. Unbundling rules, §§ 6 et seqq. EnWG

- Independence of grid operation from all other aspects of energy supply
- Could grid operators install their own storage systems?
 - No unbundling rules, since storage not mentioned? Not very convincing...
 - P2G as a power production asset?
 - Only, if sale on market?
 - Certainly prohibited: Balancing energy from own storage assets
- But changes due to new EU Electricity Directive?

IV. Standards and codes for injection of renewable gases into the gas grid

IV. Grid injection of renewable gases

1. P2G-storage gases as «biogas»?

- Preferred grid access/connection
- § 3 Nr. 10c EnWG (biogas):

*“Biomethane, gas from biomass, landfill gas, sewage gas and mine gas as well as **hydrogen** produced by water electrolysis and synthetically produced **methane**, if it can be demonstrated that **the electricity used for electrolysis and the carbon dioxide or carbon monoxide** used for methanisation each originate **predominantly from renewable energy sources** within the meaning of Directive 2009/28/EC [...]”*

IV. Grid injection of renewable gases

- «predominantly from renewable energy sources»:
- Electricity: Art. 2 (a) Directive 2009/28/EC (old RED I)
‘energy from renewable sources’ means energy from renewable non-fossil sources, namely wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases
- At least 80 % share acc. to legislative documents
- Certificates of origin sufficient?

IV. Grid injection of renewable gases

- «predominantly from renewable energy sources»:
- Carbon dioxide/monoxide:
- Renewable Energy Directive?
 - Biogas/biomass, landfill gas, sewage treatment plant gas...
 - Additional options? Direct air capture? Industrial sources?
 - “renewable non-fossil sources, namely [...]”
 - At least 80 % share?

- Injection of hydrogen into the gas grid
 - Unlike other countries (e.g. Austria, Switzerland) no set limit (5 % in old technical regulations)
 - DVGW G 262, section 5.9:
«[...] hydrogen share in the single-digit range uncritical»
 - But: other restrictions (e.g. 2 % in DIN 51624 for gas-powered cars)
- Policy document Federal Network Agency (BNetzA)
 - *Positionspapier zur Anwendung der Vorschriften der Einspeisung von Biogas auf die Einspeisung von Wasserstoff und synthetischem Methan in Gasversorgungsnetze*

IV. Grid injection of renewable gases

- Dörr/Kröger/Graf et al.,
DVGW-Forschungsvorhaben G 201205 (formerly G 5/01/12)
- Erler/Schuhmann/Köppel et al.,
Forschungsbericht G 201622 03/2019
- Current: DVGW-Forschungsvorhaben G 201902

V. Look abroad

1. Austria

- Storage generally final consumption (court decision on pumped hydro)
- Exemption for pumped hydro as well as power-to-hydrogen and power-to-methane (until end of 2020)
- No specific rules on renewable energy
- 4 % limit on the injection of hydrogen into gas grid

2. Switzerland

- Unclear whether storage is final consumption
- Industry association (VSE) manual: Not if fed back into grid
- Exemption for pumped hydro
- Plans to confirm final consumption characteristic dropped
 - Following widespread opposition
- No specific rules on renewable energy
- 2 % limit on the injection of hydrogen into gas grid

VI. Outlook and proposals

1. Potential amendments to the law

- Definition of the term (electricity) “storage“ at national level
- General, unlimited exemption from grid fees
- Changes regarding gas grid access
 - More precise definition of “biogas”, especially with regard to the carbon sources for methanisation
- Future unbundling laws may allow for the use of storage systems
- Storage as part of the grid (regulated) or market-based?

2. Outlook

- DVGW currently working on rules for hydrogen injection (up to 20 %?)
- European Committee for Standardization (CEN) attempting to regulate hydrogen injection at European level
- National implementation of Electricity Internal Market Directive

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