



Federal Ministry
for Economic Affairs
and Climate Action

Adjustments in law for a decarbonised electricity system

德国低碳化电力系统的法律调整

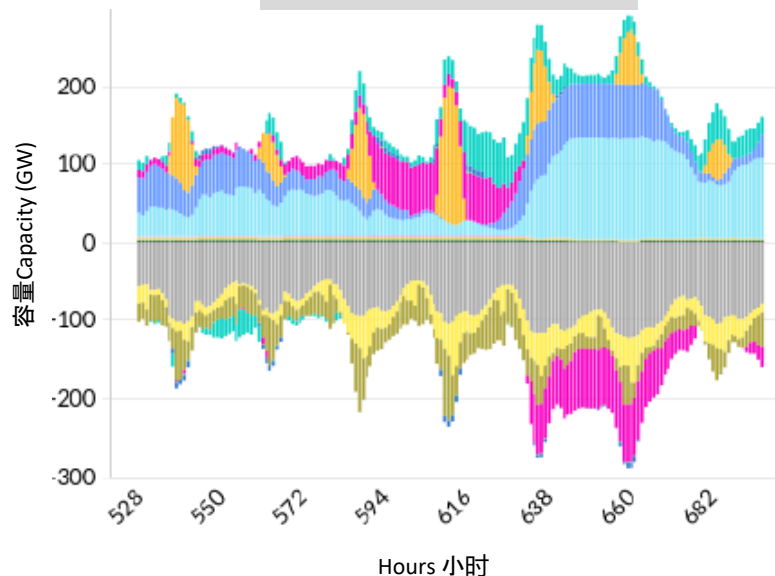
Workshop on the Legislating for A New Electricity system – Integrating
High Proportion of Variable Renewable Generation, 11 Oct 2024

新型电力系统立法研讨会, 2024年10月11日

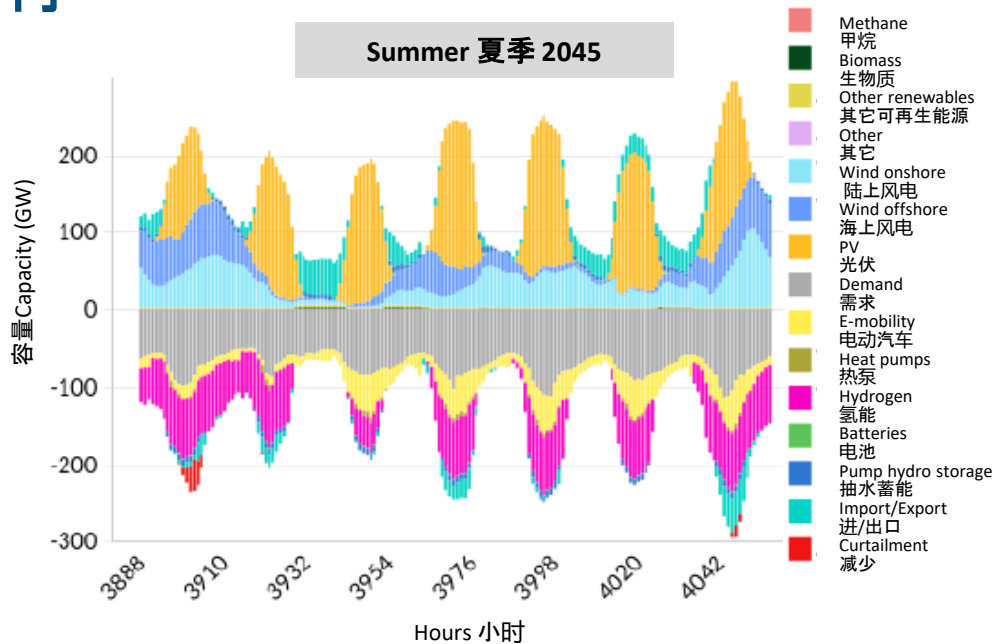
Energy transition – technical impact

能源转型——技术影响

Winter 冬季 2045



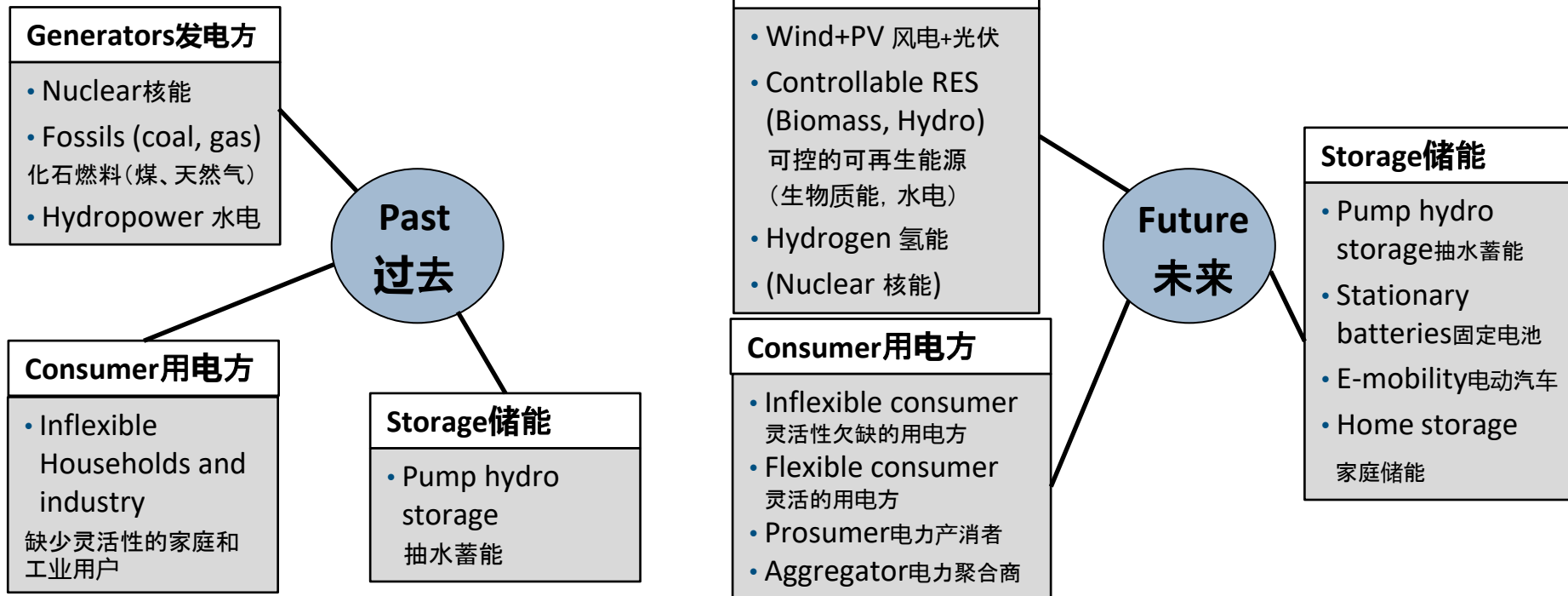
Summer 夏季 2045



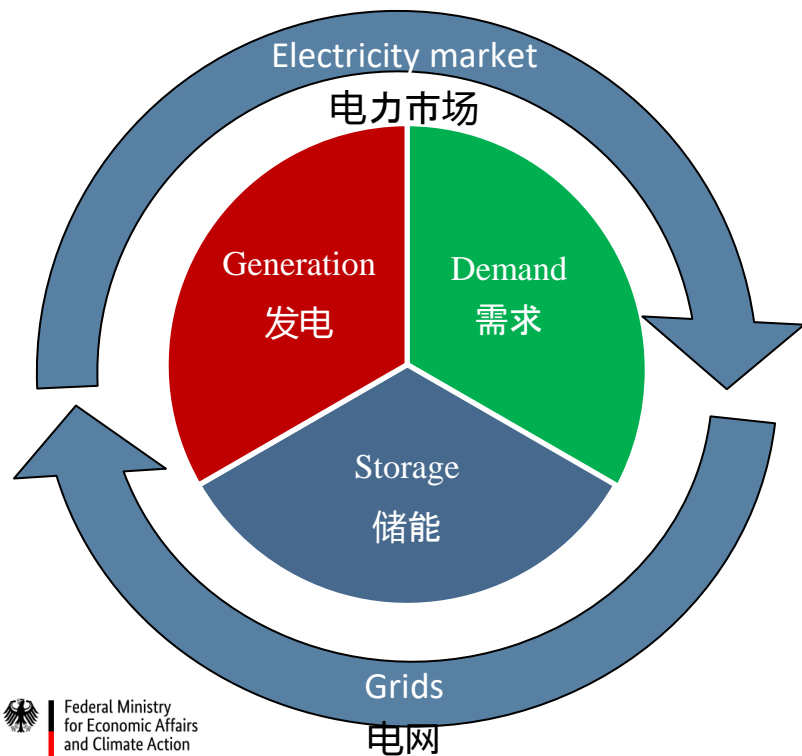
- Energy transition based on wind and PV changes fundamental principle of energy system
- **Past:** generation follows demand; **Future:** demand and generation have to come together
- 基于风能和光伏的能源转型改变了能源系统的基本原理
- **过去:**发电顺应需求; **未来:**需求和发电必须相互协调

Landscape of players

参与者的情况



Organisation of players 参与者的组织



- Actors will be connected via grids
- Actors will be coordinated via electricity market
- 电网将参与者连接起来
- 电力市场将对参与者进行协调

Future electricity market design – key tasks

未来电力市场设计——关键任务

The future electricity system needs to fulfil **four major tasks**:

1. Coordination: **Optimised dispatch** of supply and demand
2. Investment framework: **Reliable investment framework** to enable necessary investments in new technologies/capacities (both RES and non-RES)
3. Geographical balancing: Coordinating supply and demand **geographically** with **transport capacities** of the grid
4. Temporal balancing: Coordinating timing of supply and demand by increasing flexibility in a **cost-effective and system-friendly way**

未来的电力系统需要完成**四大任务**：

1. 协调：**优化供需调度**
2. 投资框架：**可靠的投资框架**，以便对新技术/容量（可再生能源和非可再生能源）进行投资
3. 地理平衡：根据电网的**运输能力在地理上**协调供需关系
4. 时间平衡：以**成本效益高、对系统友好的方式**提高灵活性，协调供需的时间安排

Future electricity market design – key areas of action

未来电力市场设计--关键行动领域



Investment framework for renewable energy 可再生能源投资框架

(Variable) renewables are the key energy source for future competitiveness and affordable energy

(可变) 可再生能源是未来实现能源经济性和竞争力的关键



Investment framework for dispatchable capacities 可调度容量投资框架

Fostering innovation, adaptability and broad technology mix

促进创新、适应性和广泛的技术组合



Locational signals 位置信号

Incentivizing local energy consumption to complement European grid expansion and renewables deployment

刺激地方能源消费，以配合欧洲电网扩张和可再生能源部署



Flexibilisation of demand 需求灵活化

Use of flexibilisation potential is key to affordable energy prices

利用灵活化潜力是实现能源经济性的关键



Key areas of action – targets

关键行动领域--目标

1. Investment framework for (variable) renewable energy: Create **reliable investment environment** via **capacity-based investment scheme**
 2. Investment framework for dispatchable capacity: Introduce **capacity market** for **dispatchable capacities**
 3. Locational signals: Introduce **locational signals** for both **investment and dispatch**
 4. Flexibilisation of demand: Set up “**flexibility-agenda**” to identify and remove barriers for market entry of demand response
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1. (可变)可再生能源投资框架:通过**基于容量的投资计划**创造**可靠的投资环境**
 2. 可调度容量投资框架:建立**可调度容量**的容量市场
 3. 位置信号:为**投资和调度**引入**位置信号**
 4. 需求灵活化:设立“**灵活性议程**”，以识别并移除需求响应进入市场的障碍

Key areas of action – implementation in law

关键行动领域--法律实施

1. Identify and define all relevant stakeholder (generators, storage operators, consumer, aggregator, etc.)
 2. Identify and define their respective roles and responsibilities
 3. Define interaction between players (market structures, etc.)
 4. Define incentive/control system for players (economic incentives, regulatory oversight, legal obligations, etc.)
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1. 确定并界定所有相关利益方(发电方、储能运营商、用电方、电力聚合商等)
 2. 确定并界定各自的角色和责任
 3. 确定参与者之间的互动关系(市场结构等)
 4. 确定参与者的激励/控制体系(经济激励、监管监督、法律义务等)

Example: regulation of capacity market

示例：容量市场监管

