

# Experiences from promising governmental and technical framework to support the biomethane industry growth in Europe

## 欧洲关于支持生物天然气产业发展的政策和技术经验

Sino-German Energy Partnership | 2. November 2021

中德能源与能效合作伙伴

# Agenda

## 日程

1. Number of Biogas and Biomethane Plants in Europe
  2. Plant examples in Europe
  3. Steps and Rules of Grid Injection
  4. Challenges Biomethane Grid Injection
  5. Solutions
1. 欧洲的沼气和生物天然气工厂的数量
  2. 欧洲沼气和生物天然气工厂案例
  3. 并入管网的步骤和规则
  4. 生物天然气并入管网所面临的挑战
  5. 解决办法

# 1. Biogas Plants in Europe 欧洲沼气工厂

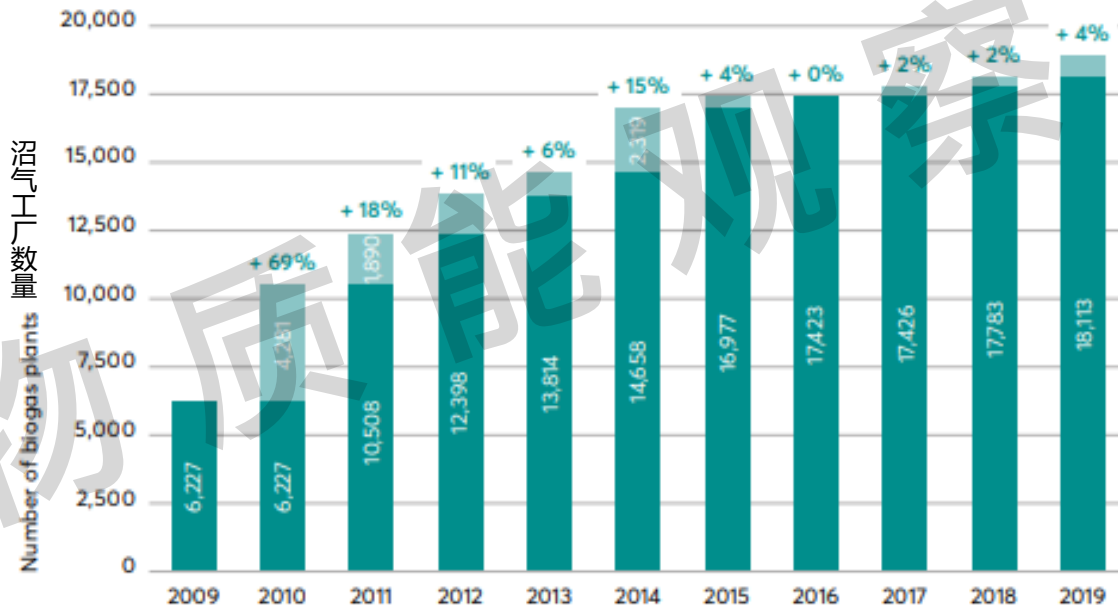


FIGURE 2.1

Development of the number of biogas plants in Europe, 2009-2019

2009—2019年欧洲沼气工厂数量增长情况

■ Existing plants 现有沼气工厂数  
■ New plants 新建沼气工厂数



# 1. Biomethane Plants in Europe 欧洲生物天然气工厂



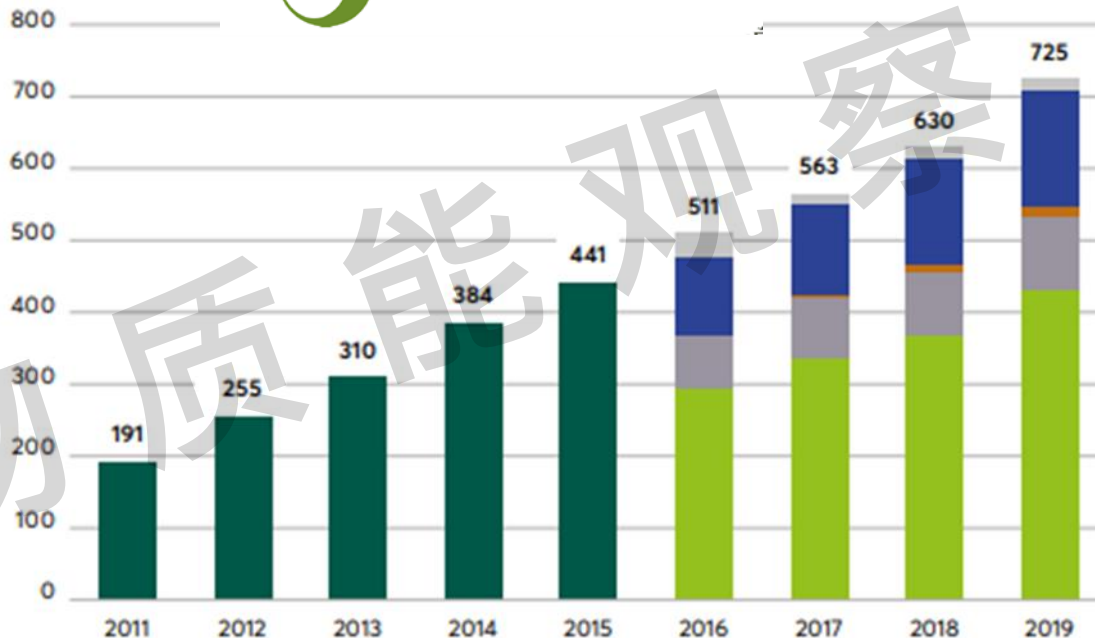
FIGURE 3.2

Development of the number of biomethane plants in Europe, 2011-2019, with a breakdown by feedstock type, 2016-2019

2011—2019年欧洲生物天然气工厂数量增长，包括2016—2019年原料详细情况

- Agriculture 农业
- Sewage 污水
- Landfill 垃圾填埋
- Other 其他
- European total 欧洲总计
- Unknown 不详

生物天然气工厂数量



**Future concept in commissioning: Effisludge – Integration of paper sludge, biogas plant, LBG**

**已经转为现实的超前理念：Effisludge——造纸污泥、沼气厂与液化沼气的综合体系**



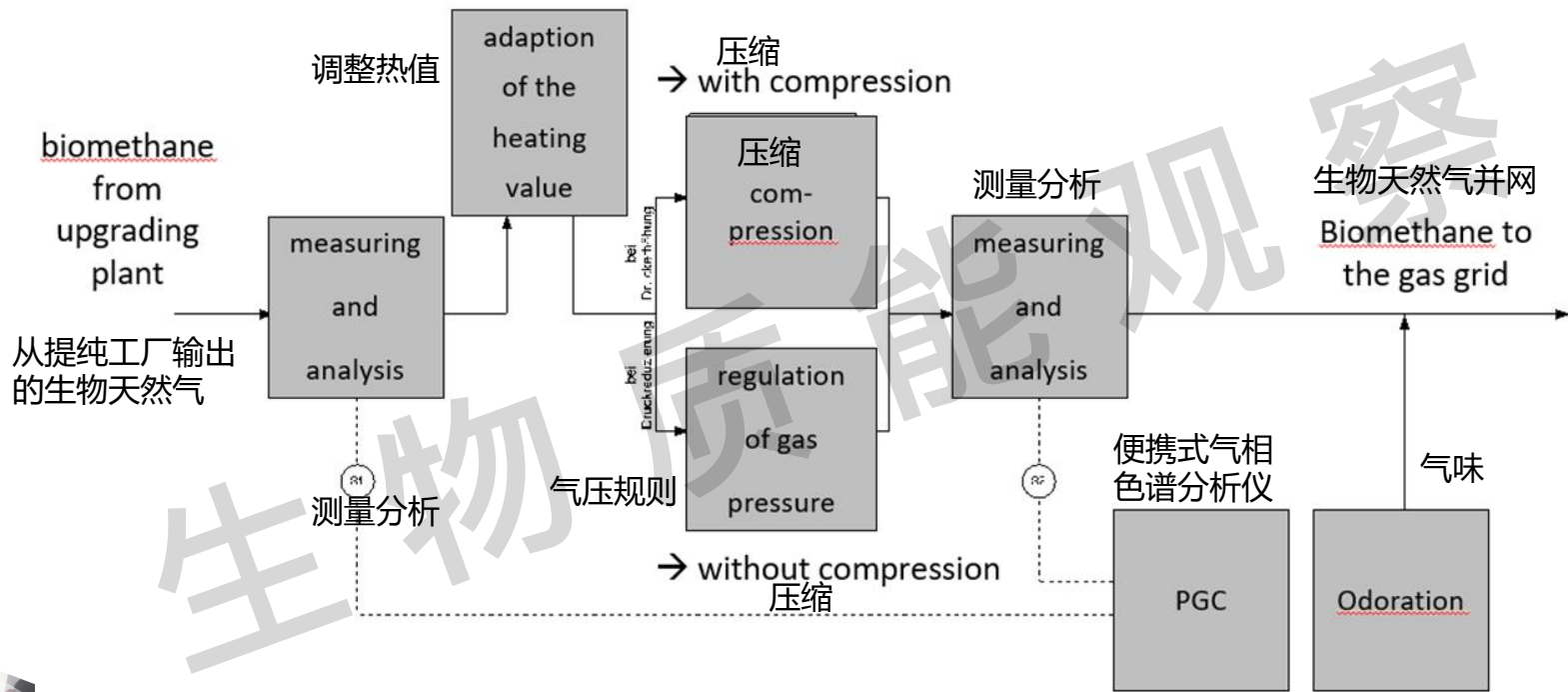
# Large scale example Germany

## 德国大量投产的案例

- 400.000 t energy crops per year  
每年400,000吨能源作物
- 1 year from start to full load  
从开始投产到满负荷运行需要1年时间
- 20 ha area for the plant, 82 Mio € investment  
工厂占地20公顷，投资8200万欧元



### 3. Steps for Grid Injection 生物天然气并入管网步骤



Source: Gasnetze der Zukunft  
来源: Gasnetze der Zukunft

### 3. Rules for Grid Injection 并网规则

Further rules, which need to be defined:

接下来需要制定的规则:

Priority of grid injection for biomethane

生物天然气并网的优先权

Selection of an alternative point of grid injection in case of limited capacity

在有限的情况下, 选择并网点

Timetable for checking and implementation of grid injection

检查和实施并网的时间要求

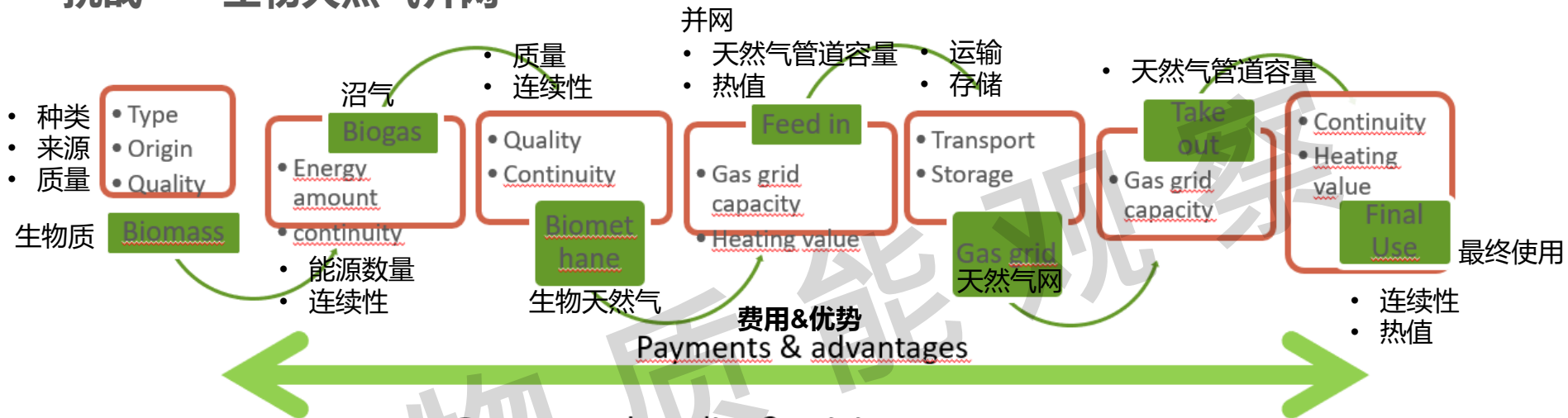
Consequences if standards can not be met (e.g., gas quality) – including time periods for checking data and reconnecting in case of insufficient gas quality

不能满足要求 (如气体质量) 的解决办法: 包含检查数据以及在气体质量不足的情况下重新并网的时间段



# 4. Challenges – Biomethane in the gas grid

## 挑战——生物天然气并网



- Guaranteed quality & origin
- Ownership
- Certification procedures (amount & quality)
- What is “biomethane” (by law)
- Who takes care & how is that paid?
- 质量&来源保障
- 所有权
- 许可流程 (数量&质量)
- 什么是法律意义上的“生物天然气”
- 由谁管理&如何支付相关费用?

## 4. Challenges – Biomethane in the gas grid

### 挑战——生物天然气并网

- Value of biomethane: physical + intrinsic („green”)  
生物天然气数值：物理数值+内在数值 (“绿色”)
- The physical flow is different from the intrinsic value  
物理数值与内在数值不同
- intrinsic value must be realised on the market at level needed to secure cost recovery  
内在数值必须在市场上实现，以确保回收成本
- Requirement for biomethane trade:  
交易生物天然气的要求：
  - „green” quality & physical amount must be certified at the location of production  
“绿色”质量和物理数值必须在产地得到认证
  - “green” quality & physical amount must be acknowledged at the consumer  
“绿色”质量和物理数值必须得到消费者的认可
- A mass-balancing is required in the whole gas grid  
需要在整个天然气网中实现质量平衡
- Double-counting must be excluded  
必须排除重复计算的情况

## 5. Solutions – 1. Biomethane feed in tariffs

### 解决方案 - 1. 生物天然气上网电价

- Technically easy 技术上容易实现
- All certification takes place at the location of biomethan production and feed in  
在生物天然气生产和上网的地方进行所有的认证
- Feed in tariffs have to compensate production costs -> no real market; Society takes the costs  
上网电价必须补偿生产成本 -> 没有真正的市场; 社会承担成本
- No control regarding gas use  
没有控制气体使用
- Double-counting easily avoided  
容易避免重复计算
- Biomethane in the grid can be handled as any other gas  
管网中的生物天然气可以像其他气体一样被处理
- “green” properties are lost when gas is in the grid  
气体并入管网时, “绿色”属性就不存在了

## 5. Solutions – 2. No biomethane feed in tariffs 解决方案 – 2. 无生物天然气上网电价

- Incentives necessary for designated biomethane use  
指定使用生物天然气所需的激励措施
- Technically complex  
技术复杂
- All certification has to follow the whole process chain  
必须在整个工艺链上进行所有的认证
- Biomethane production costs & grid transport have to be covered by final consumer  
生物天然气生产成本和运输费用必须由最终消费者承担
- Double-counting has to be avoided  
必须避免重复计算
- Biomethane pathway has to be followed through the gas grid virtually  
运输生物天然气必须依靠天然气网



## Biogas & Biomethane – Key technology for energy systems and material cycles of the future

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## 沼气和生物天然气——未来能源系统 和物质循环的关键技术

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