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BUSINESS DEVELOPMENT CONSULT

Doubling energy efficiency and cleaning emissions of decentralized 100 – 150MW coal power stations

双倍能源效率和洁净排放分离式100-150兆瓦特煤炭发电站

4th Global Green Economy Prosperity Forum of International Green Economy Association

Integrated Gasification & Combined Cycle power plants [IGCC] 联合汽化和混合循环型发电厂

to allow cleaning of product gas prior to combustion
进气过程前清洁进料气体

- This type of reactor operates at very high temperatures (1,200–1,600° C)
- 此类反应器在极高温度下操作(1,200–1,600°C)
- this increases investment and maintenance cost exponentially
- 维护成本投资将以指数方式增加
- this reactor type requires pure Oxygen
- 此类反应器需要纯氧驱动

➡ IGCC is used for downstream Chemical Synthesis output products

➡ 联合汽化和混合循环型反应堆为下游化学合成产品应用

poor carbonaceous solid fuel transformation
贫碳固体燃料转换为富含

into energy rich product gas
能量产品气

- developed over the last decade by the **Future Energy-Technologies** group at University of Technology Vienna [AUT]
- 由奥地利维也纳技术大学未来能源技术小组在过去十年中开发
- called **steam driven dual fluidized bed gasification** [SD-DFBG]
- 蒸汽驱动双流化床技术[SD-DFBG]
- so far only industrialized for high energy efficient biomass use
- 尽管目前该技术仅适用高能源效率处理生物垃圾的工业化要求
- **SD-DFBG** was further experimentally **proven for** cheap low-grade **coal fuels**
- 进一步实验已证明廉价低效率的煤炭可以使用此技术处理

steam driven dual fluidized bed gasification
蒸汽驱动双流化床技术

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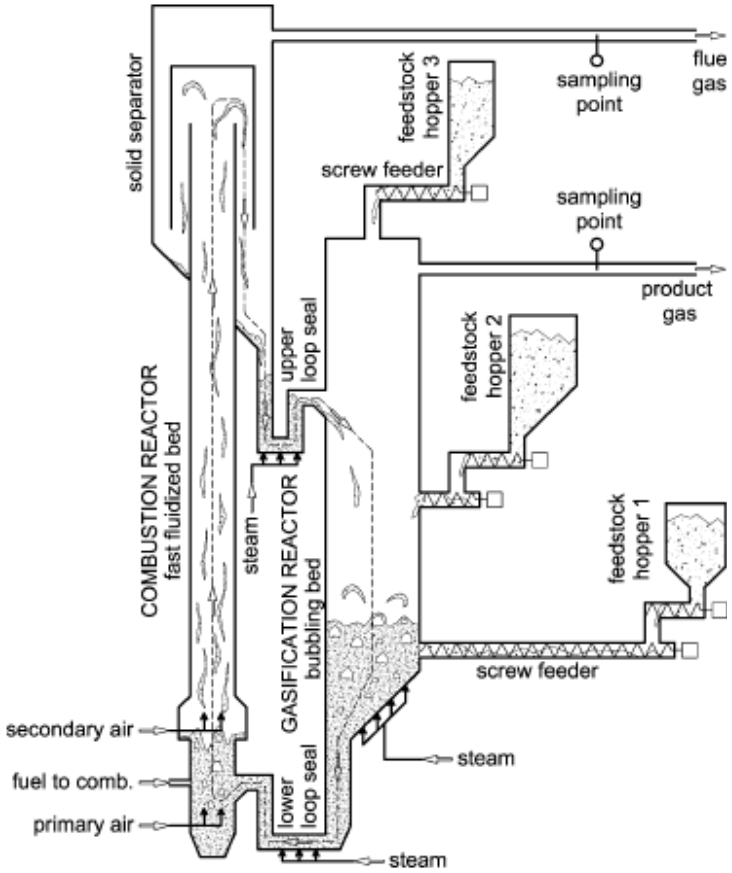
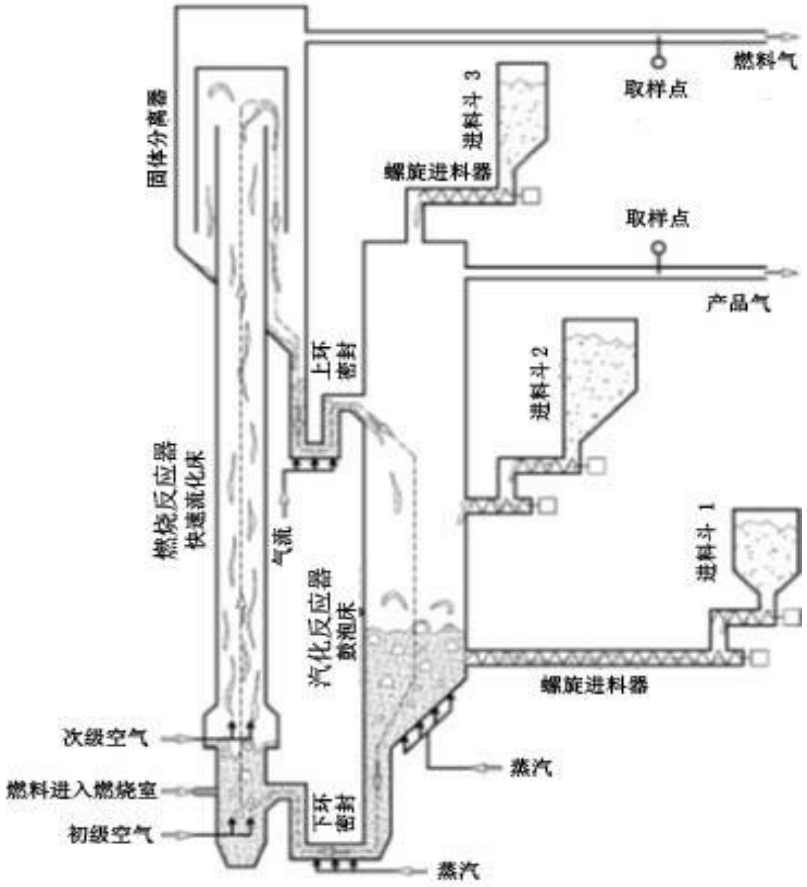
SD-DFBG

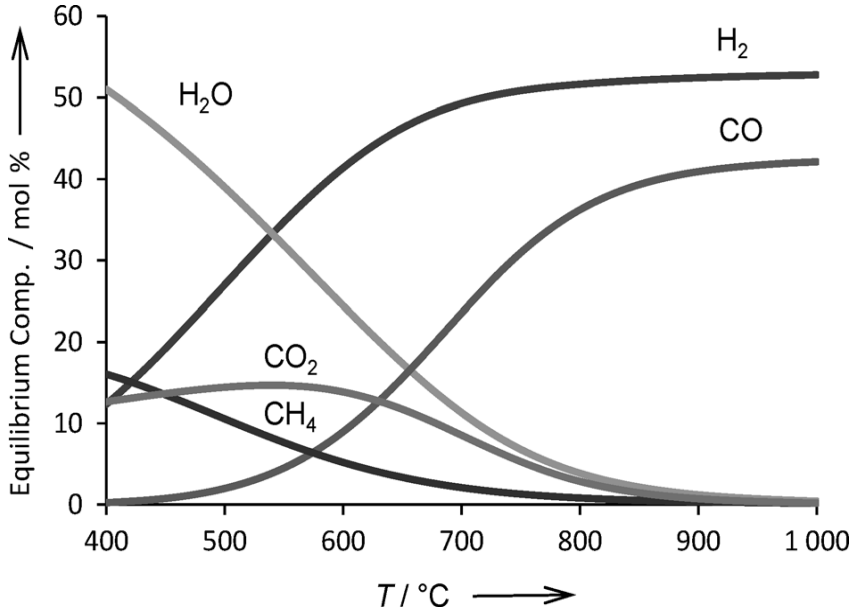


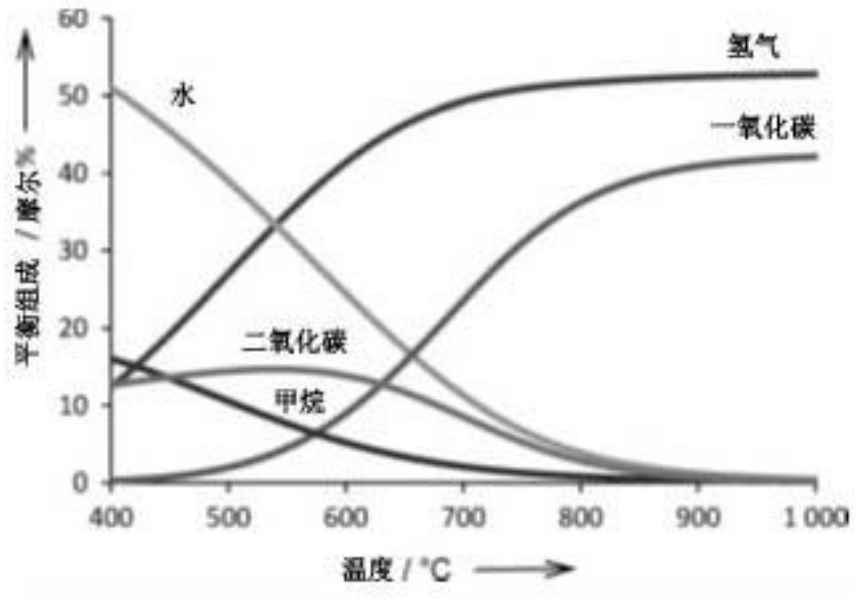


Low sensitivity to different fuels
对不同进料具有良好兼容性

equilibrium compositions on temperature

有关的组分对温度平衡如图



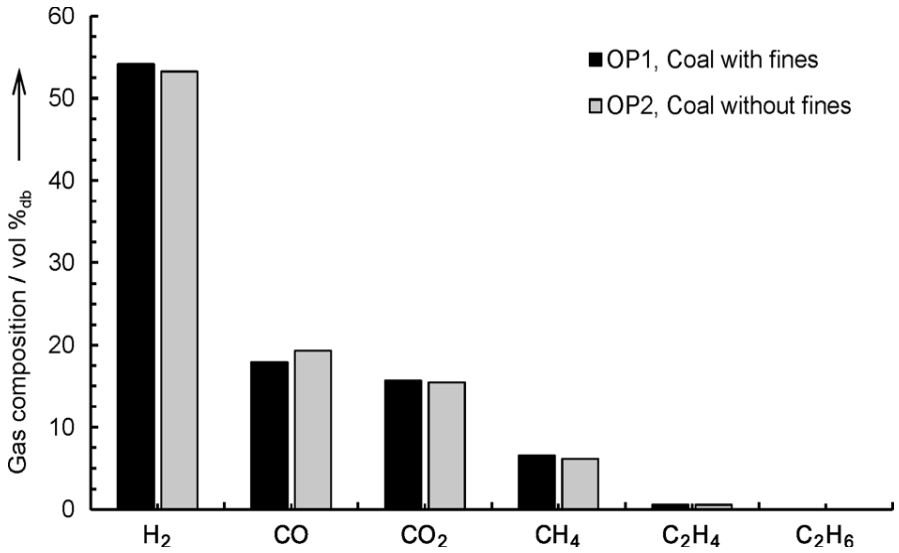


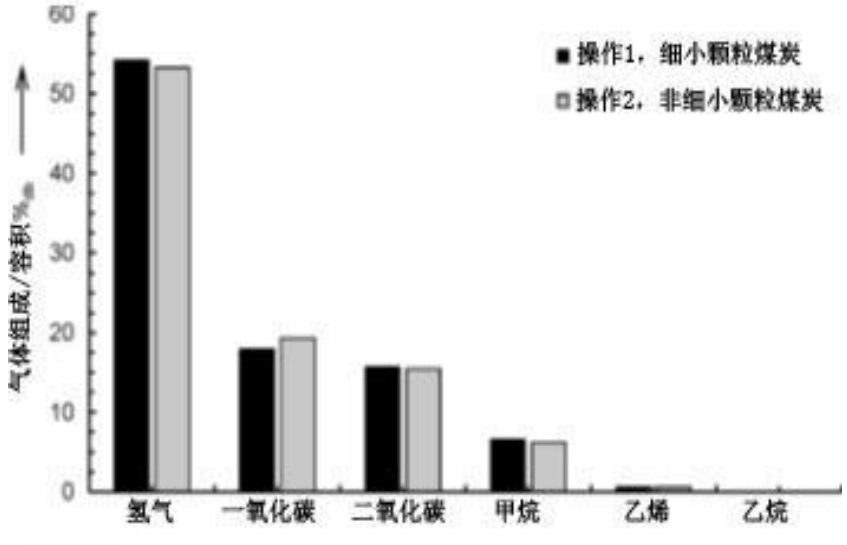
Using steam as a gasification agent allows process adjustments to actual fuel qualities via optimum steam-to-fuel and steam-to-carbon ratios.

该过程使用蒸汽作为汽化介质允许通过优化气体转化为燃料和气体转化为碳的比例两方面进行调节

Product gas composition of the performed tests
图三:产品气体组成测试

main gas components of the product gas
产品气中主要气体成分



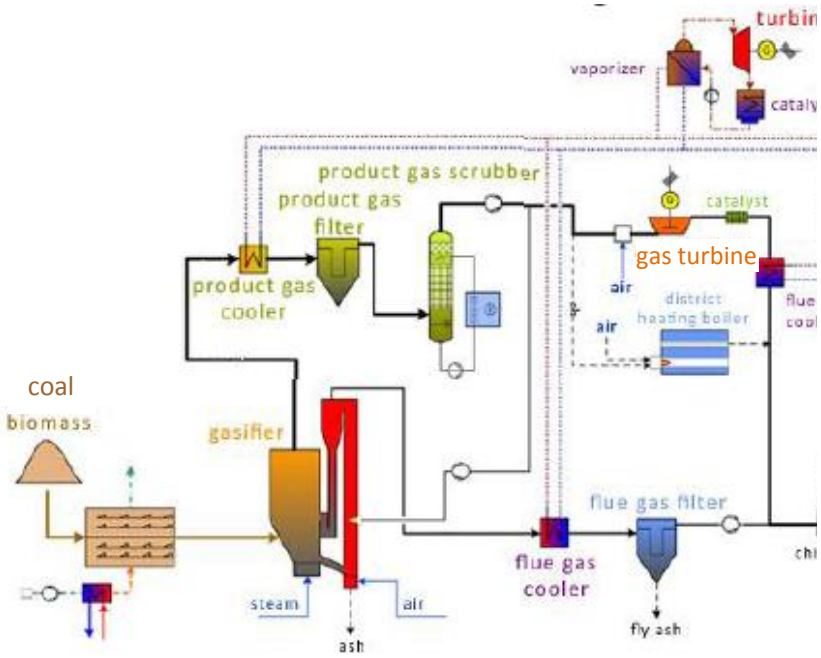


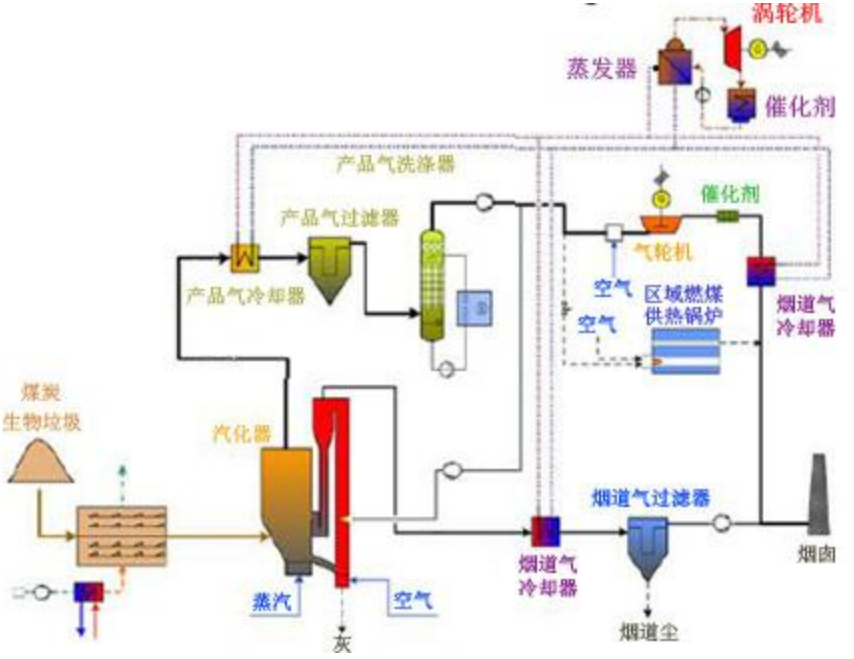
The DFB gasification process yields two separate gas streams, a product-gas stream (gasification reactor) and a conventional flue-gas stream (combustion reactor).

双流化床汽化过程产生两股分离气流，产品气流(来自汽化反应器)和常规燃料气流(来自燃烧反应器)

CC CHP electricity from Product Gas
混合循环型 发电

cleaning of product gas prior to combustion
汽涡轮机进气过程前清洁进料

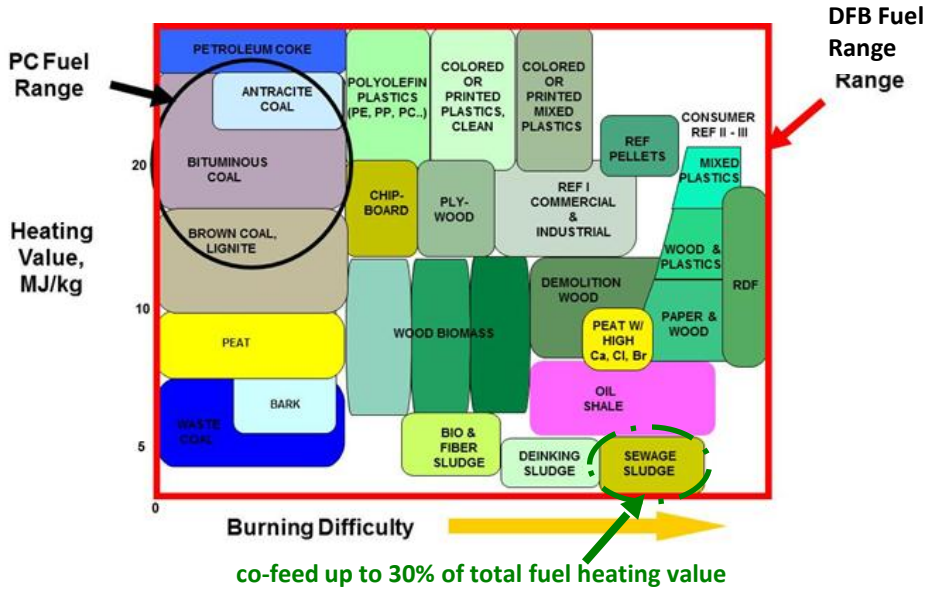


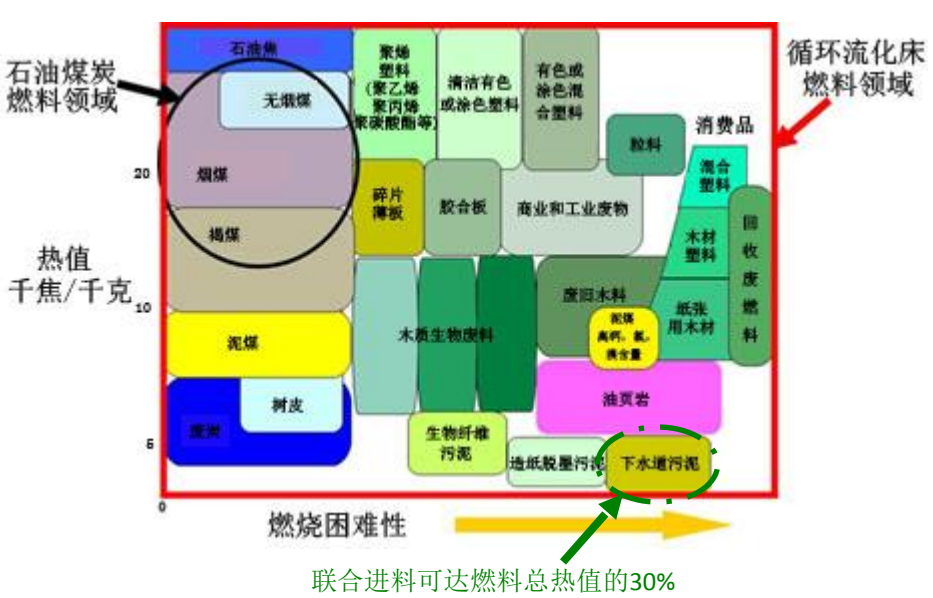


At state of the art gas turbine efficiency in the order of 40% this could generate 1.6MW_{el} in single mode and an additional 0.8MW_{el} in combined heat cycle per ton coal.
根据当前汽轮机效率为40%计算，这将在单一燃烧模式多产生1.6兆瓦电力或在联合热循环中再附加0.8兆瓦电力/**吨煤**

Opportunities for CO_2 recycling
实现二氧化碳循环

Fuel Flexibility
提高燃料适用性

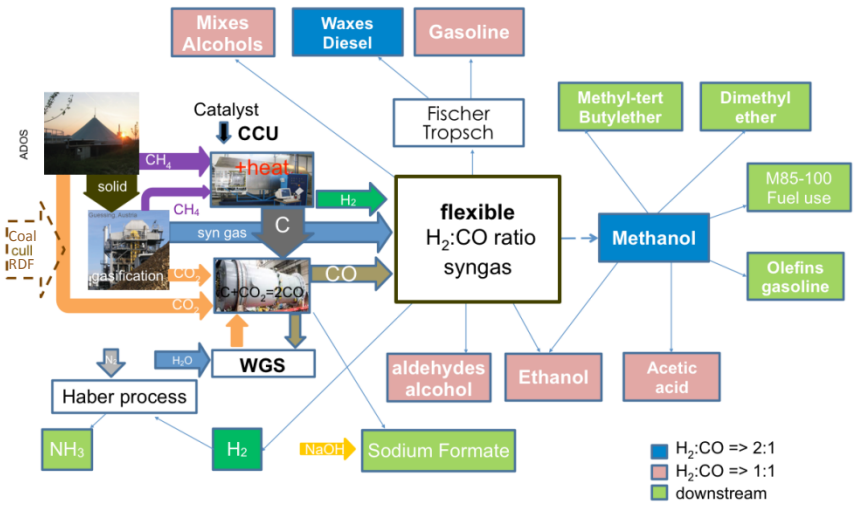


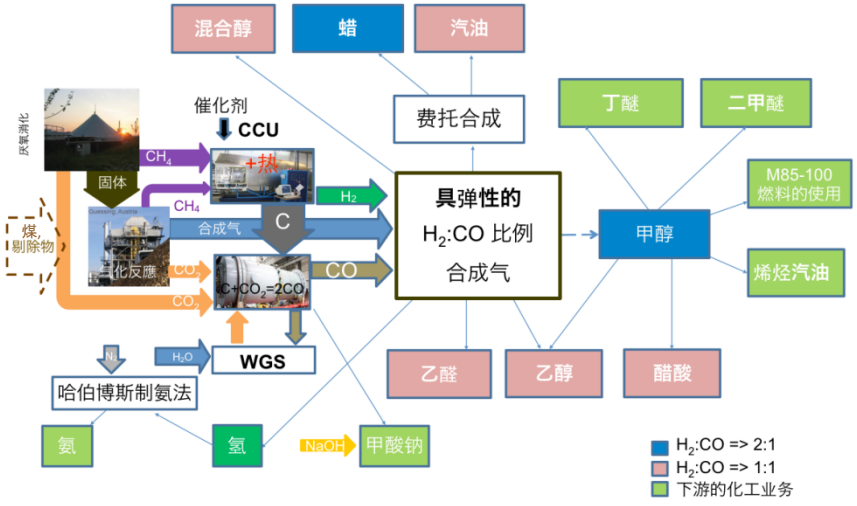


up to 30% of the heating content of fuel could come from renewable or repeatable source
燃料热值的30% 可由可再生和可重复利用资源提供

Opportunities to combine state of art Technologies
整合最新技术的机遇

Carbon Capture for Use [CCU] as refining intermediate
碳元素捕捉应用专利技术作为炼厂媒介物



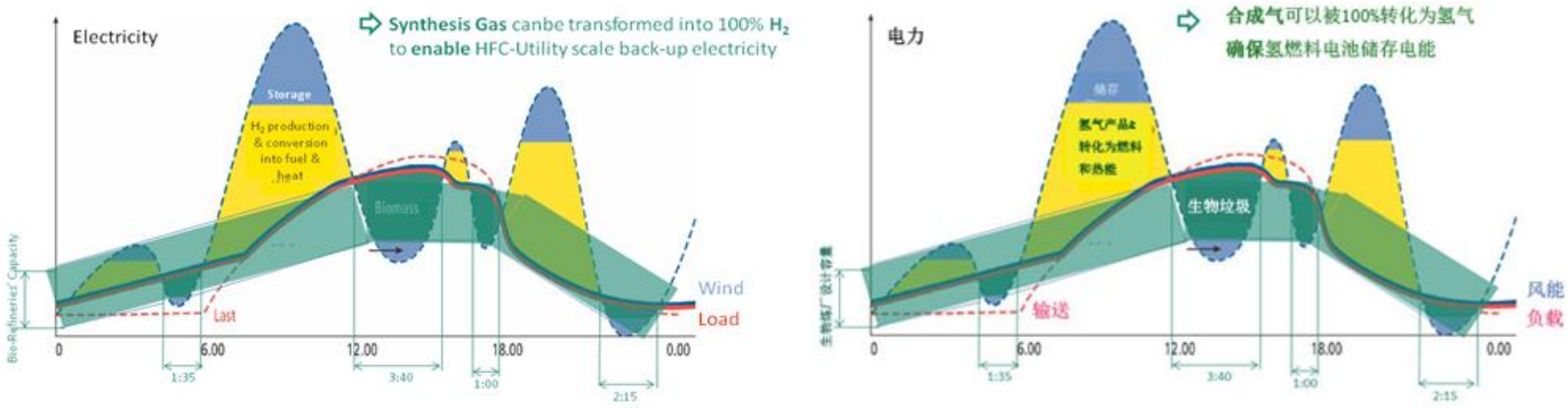


From all our work in the field of MSW-to-value we also see opportunities for a flexible Synthesis gas platform to contribute towards a cleaner energy future of China.

根据我们在城市固体垃圾转化为有价值产品做的所有工作，我们也发现了整合现有最新技术为中国开创一个洁净能源未来的机遇

flexible operating mode Synthesis gas platform
灵活操作模式和合成气体平台

to overcome consequences of volatility in NRE grid configurations
同时有助于克服可再生能源网络构造的波动问题



While Photo Voltaic and/or wind energy are productive, the coal gasification plant can in contrast to conventional thermal power plants produce Chemical Synthesis products and therefore achieve economically attractive utilization.
由于太阳能光伏和/或风能利用卓有成效，煤炭汽化厂相对于与传统热电厂供可以提供化工合成原料，因此可以具有更多经济应用吸引力

Future of decentralized Power Generation
未来分离式发电厂

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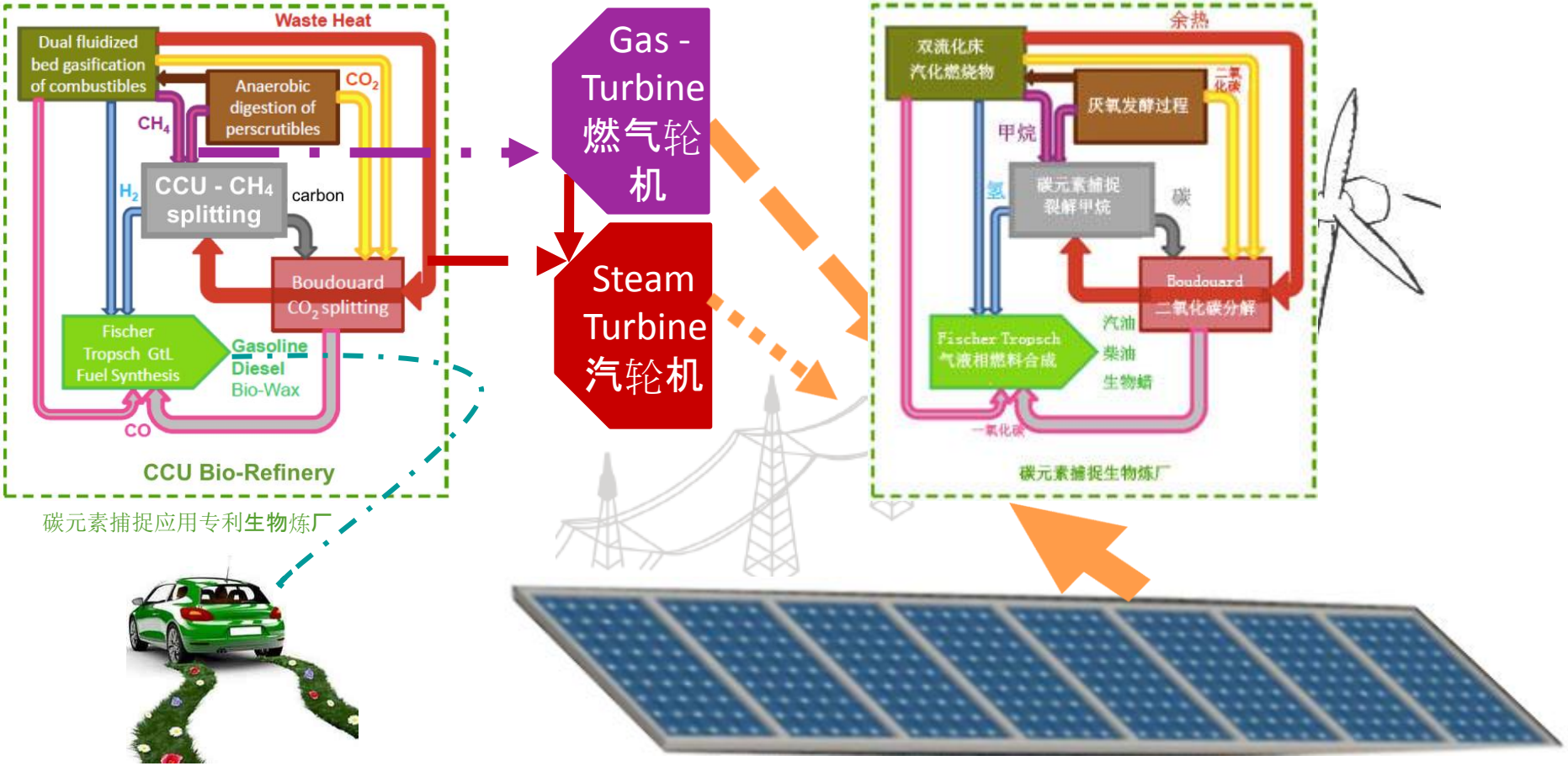
Hybrid combination of NRE & Synthesis Gas Chemistry
有机组合新型可再生能源和合成气化学技术



We’ ld like to support China becoming leader in “affordable Clean Energy”
我们致力支持中国成为可利用清洁能源的领先者

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