



The Progress of Biomass Refining Project and the Industrialization of SAF in SQ Group

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02. SAF Production Route One

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04. Industrialization prospect



1. Project background and the biomass fractionation

Reduce reliance on fossil resources and promote the transformation to a low-carbon economy

Promote the efficient utilization of resources and circular economy

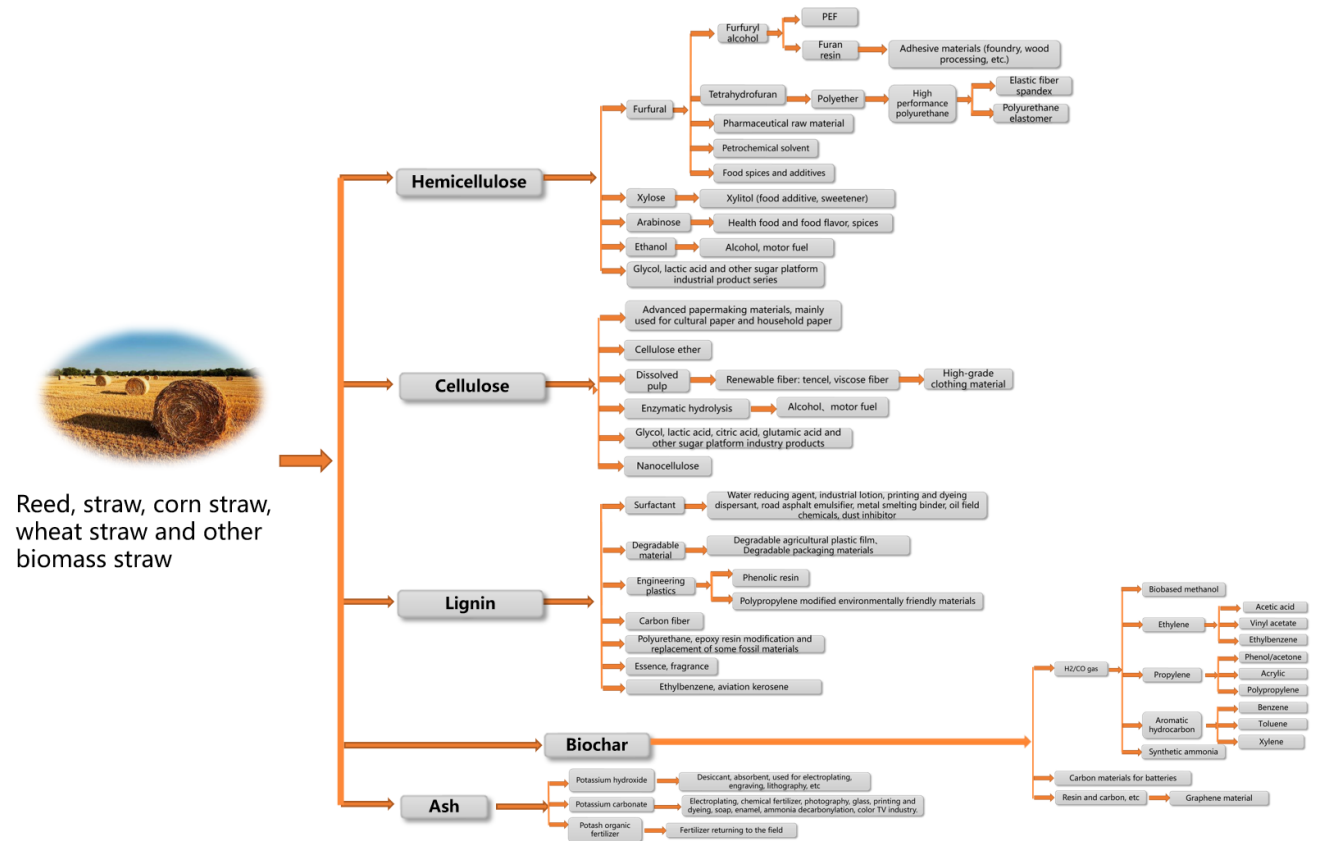
Promote the localization and inclusiveness of the global biomass industry

Deal with the global resource crisis and climate change

1. Project background and the biomass fractionation

Conclusion

The biorefinery technology for biomass fractionation is not only a scientific breakthrough but also an important pillar for global sustainable development. It provides systematic solutions for addressing climate change, reducing fossil dependence and promoting economic transformation through efficient resource utilization, low-carbon production models and technological inclusiveness. In the future, with the further promotion and industrialization of technology, its global significance will become more prominent.



1. Project background and the biomass fractionation

Daqing ShengquanGreen Technology Company Limited Introduction to the First Phase Project

Project investment
25 billion yuan

The first phase of the project has completed an investment of approximately 2.5 billion yuan. The construction contents mainly include the material preparation workshop, biomass refining workshop, cellulose workshop, cellulose product workshop, liquid finished product and raw material tank area, etc.

Straw can be processed
500,000 tons

It can process 500,000 tons of agricultural straw annually, produce 208,000 tons of cellulose and cellulose products, 20,000 tons of high-quality furfural, 15,000 tons of high-quality acetic acid, 160,000 tons of high-quality biochar, etc. annually.

Annual sales revenue
1.6 billion yuan

After reaching full production capacity and efficiency, the annual sales revenue will be approximately 1.6 billion yuan, and the annual profit and tax will be about 500 million yuan. It can directly provide employment for over 700 people and indirectly provide employment for over 3,000 people. The income from straw alone can directly increase income of farmers by 100 million yuan.



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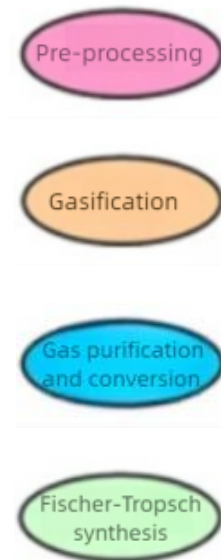
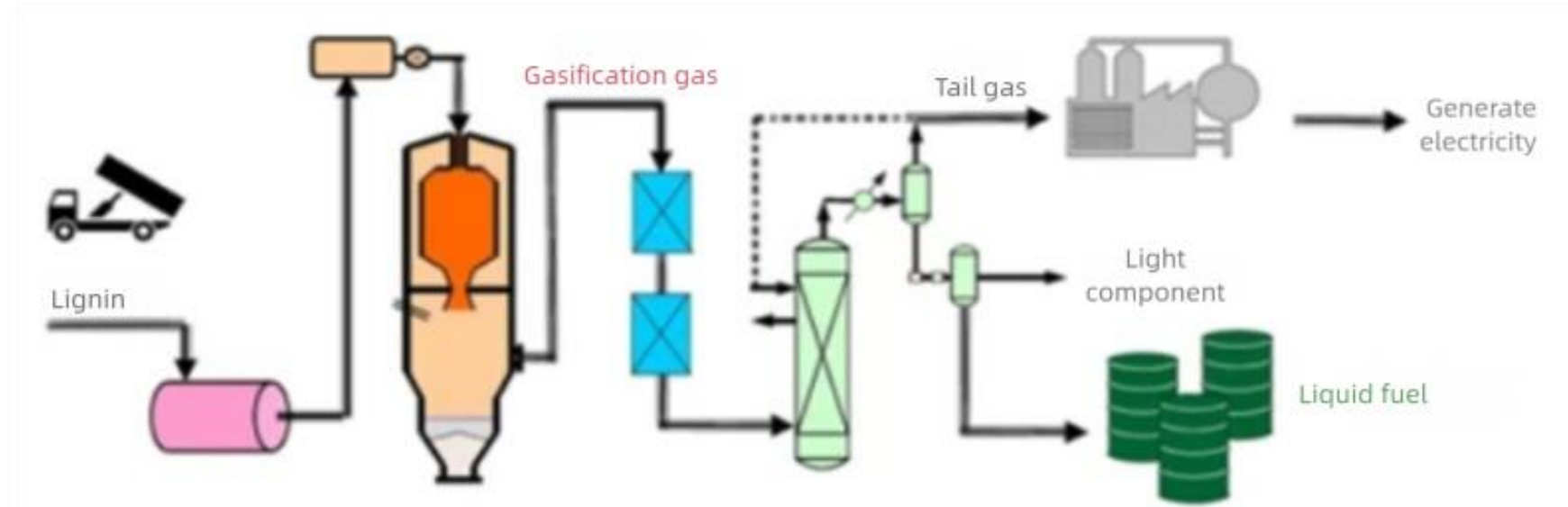
04. Industrialization prospect



2. SAF Production Route—Lignin gasification → Green methanol → Fischer-Tropsch synthesis

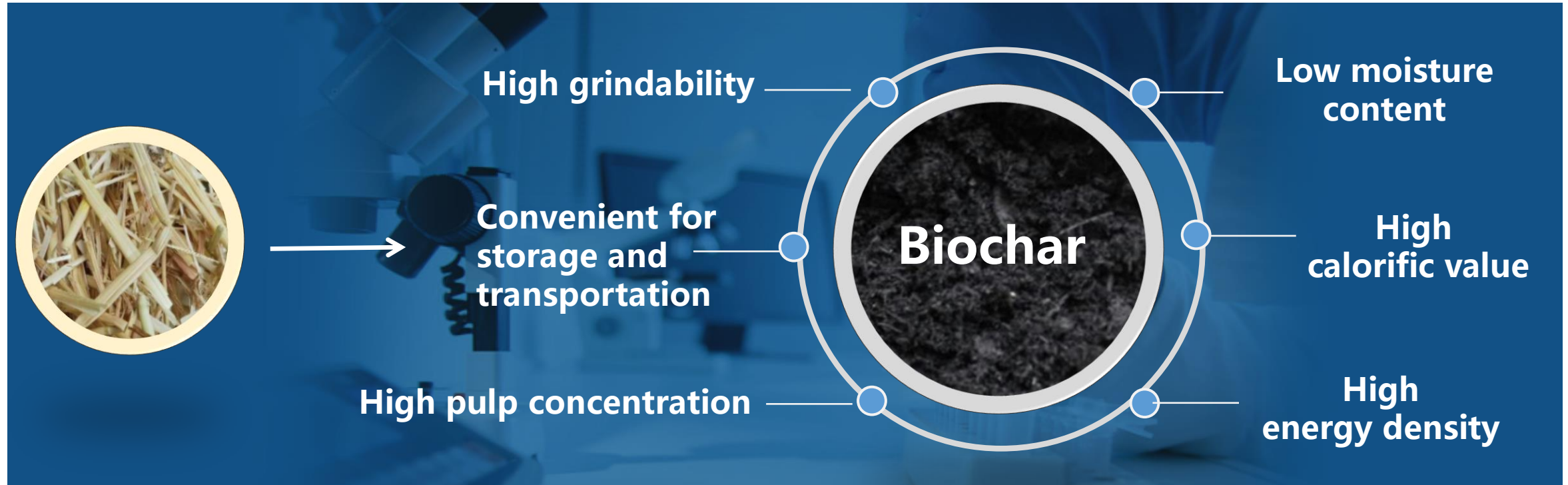
Process technology flow

1. Gasification to produce syngas: Lignin is vaporized at high temperatures to generate CO/H₂ syngas. —Key process technologies
2. Synthesis methanol gas: Synthesis gas is converted into green methanol by a traditional processes, with methanol purity reaching fuel-grade standards.
3. Methanol to SAF: The FT (Fischer-Tropsch synthesis) process in ASTM D7566 standard is adopted to produce SAF blended fuel that meets the aviation kerosene standard.



2. SAF Production Route—Lignin gasification → Green methanol → Fischer-Tropsch synthesis

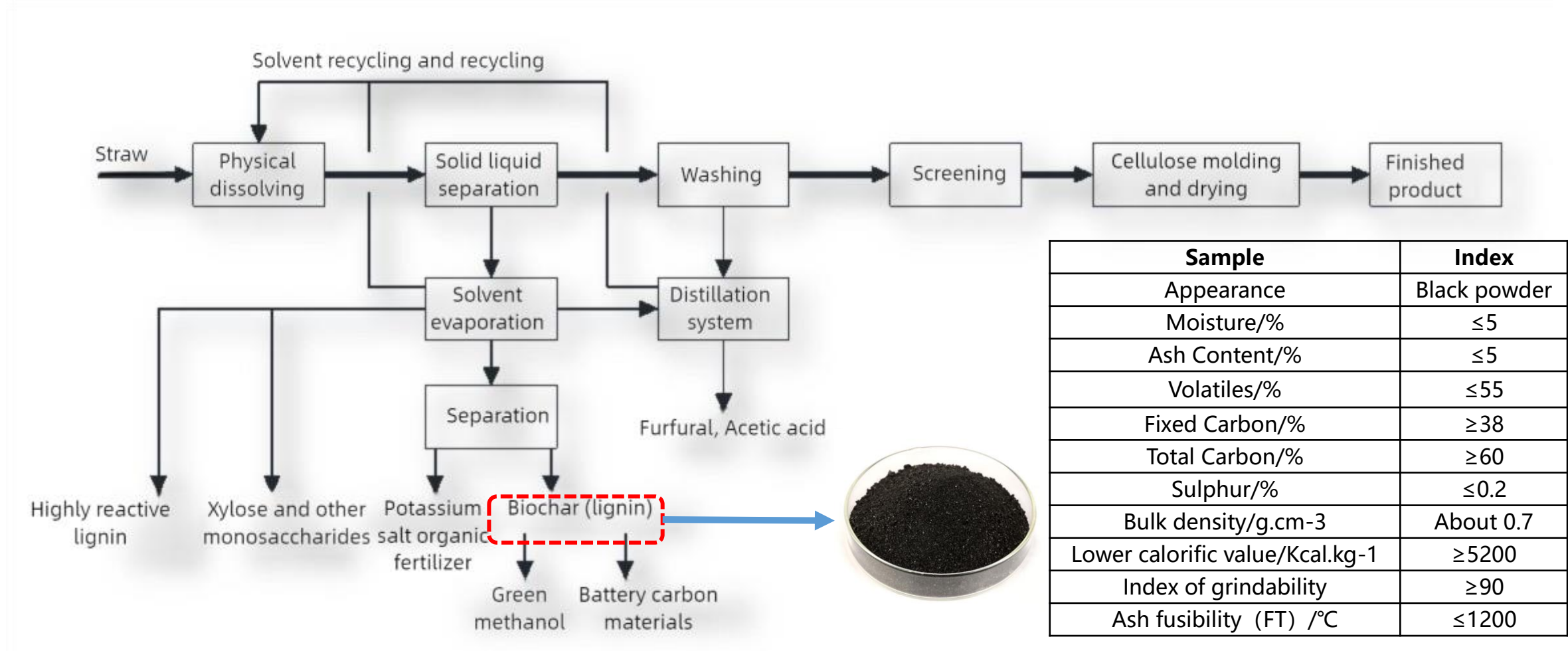
Feasible solutions for biomass gasification



A relatively feasible solution

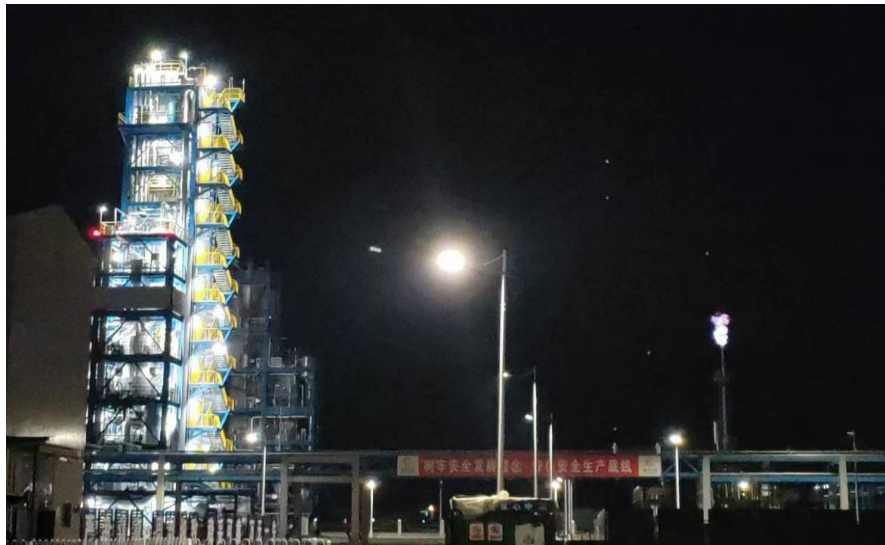
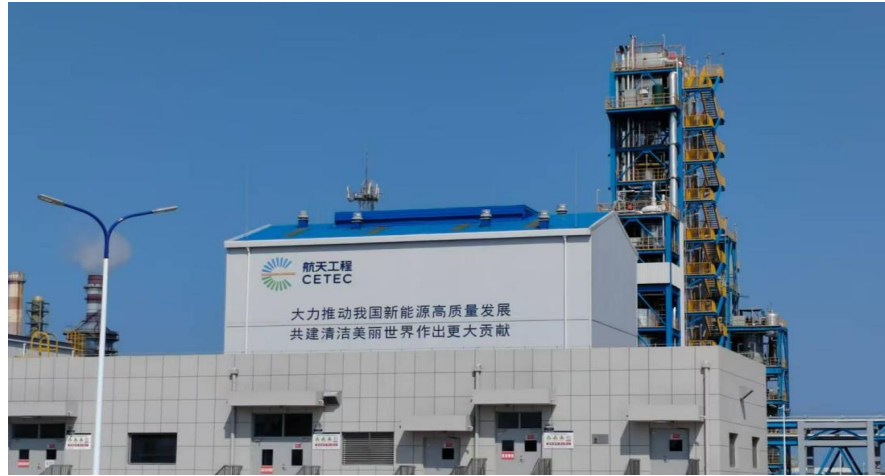
Firstly, the biomass should be carbonized to enhance its energy density, grindability and transportability, converting it into biochar with low moisture content and high calorific value, thereby adapting to the efficient fluidized entrained flow gasification technology that has been maturely applied in coal chemical industry.

2. SAF Production Route—Lignin gasification → Green methanol → Fischer-Tropsch synthesis



Flowchart of the integrated biorefinery process of "Shengquan Method"

2. SAF Production Route—Lignin gasification → Green methanol → Fischer-Tropsch synthesis



2. SAF Production Route—Lignin gasification → Green methanol → Fischer-Tropsch synthesis



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《气流床生物质气化制备合成气技术试验研究》

航天炉中试装置生物质气化试验报告

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表 2-5 干基合成气分析数据

对应炉压 MPaG	检测时间	CO %	H2 %	CO2 %	CH4 %	N2 %	干基有效气 %	检测方式
3.0	20240813/18:04	51.37	24.51	5.21	0.76	17.10	75.88	手持分析
3.0	20240813/20:13	54.06	25.83	4.91	0.48	14.40	79.89	手持分析
3.0	20240813/20:28	51.83	29.05	4.81	0.47	13.69	80.88	色谱分析
3.0	20240814/11:13	53.78	25.53	4.96	0.99	14.50	79.31	手持分析
3.0	20240814/11:13	51.19	29.09	4.87	0.94	13.77	80.28	色谱分析
3.0	20240814/11:55	53.76	24.83	4.89	0.33	15.60	78.59	手持分析
3.0	20240814/11:55	50.97	28.63	4.45	0.30	15.03	79.60	色谱分析
3.0	20240814/11:59	54.45	24.93	5.03	0.22	15.00	79.38	手持分析
3.0	20240814/11:59	51.31	28.13	4.79	0.19	14.83	79.44	色谱分析
3.0	20240814/12:02	54.48	24.94	5.21	0.15	14.90	79.42	手持分析
3.0	20240814/12:02	51.66	28.77	4.75	0.12	14.29	80.43	色谱分析
3.0	20240814/12:05	54.46	24.90	5.37	0.12	14.90	79.36	手持分析
3.0	20240814/12:05	51.75	27.91	5.72	0.10	14.21	79.66	色谱分析
3.0	20240815/09:06	53.78	26.68	5.12	0.28	13.90	80.46	手持分析
3.0	20240815/09:06	51.09	30.51	5.01	0.26	13.01	81.60	色谱分析
3.0	20240815/10:17	53.80	25.61	4.80	0.64	14.80	79.41	手持分析
3.0	20240815/10:17	51.39	29.25	4.70	0.60	13.82	80.64	色谱分析

表 2-6 粗渣分析

压力	粗渣残碳%	细渣残碳%	粗细渣比（干基）
3MPaG	0.06	11	0.77



图 2-1 粗渣形态

2.4 试烧试验性能计算

取试验期间 3.0MPaG 满负荷工况下，运行稳定且检测数据较全的时间段进



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部通径仅 6mm，导致碳化生物质在输送过程中很难保证长期稳定运行，一旦有碳粉管线的切换后，其波动会越发频繁，稳定性越难以控制。圣泉生物质相对来说输送非常稳定，第一次投料后因为与中能建的生物质料有混合过渡阶段，相关操作还有所波动，但连续运行 2.5 小时后运行非常平稳，鉴于现场操作人员体能原因现场主动停车，次日实现最长连续运行时间为 28.5 小时，其停车原因由于磨煤机故障导致原料供应不足，无法实现业主要求的连续 72 小时生产。

3) 圣泉生物质灰粘度低，可添加高岭土进行灰调控，解决气化温度和灰粘度不匹配的问题。在添加助剂后，黏温特性得到大幅改善，壁面挂渣良好，无超温现象，也能够实现稳定排渣。

4) 圣泉生物质颗粒气化反应活性很好，碳转化率可达到 99%以上，气化指标较优。

5) 航天气化试验平台为航天工程为解决相关工程问题，做为试验验证的平台，其主要功能与客户的要求和理解有较大差距，因此可能无法达到部分业主的所有预期目标，特此予以说明。

- ✓ The gasification reaction activity of lignin raw materials of SQ Group is very good, with a carbon conversion rate of over 99% and superior gasification indicators.
- ✓ Approximately 1.6 tons of SQ Group lignin can produce 1 ton of methanol.

2. SAF Production Route—Lignin gasification → Green methanol → Fischer-Tropsch synthesis



01
It is 100% derived from biomass and has a natural zero-carbon attribute, which aligns with the goal of carbon neutrality

02
It has low ash content and high calorific value, and can completely replace coal for use, being clean and efficient

03
It features small particle size, good fluidity and high grindability, which is convenient for large-scale industrial application

04
It is currently the only known biomass raw material that can be applied on a large scale to the gas flow bed in coal chemical industry

05
With a production capacity of 100,000 tons, the quality is stable and uniform, and it can be supplied continuously for a long time

06
It has passed the ISCC EU & ISCC PLUS international sustainable development and carbon certification

07
Listed company, brand guarantee, complete logistics chain, high business reputation



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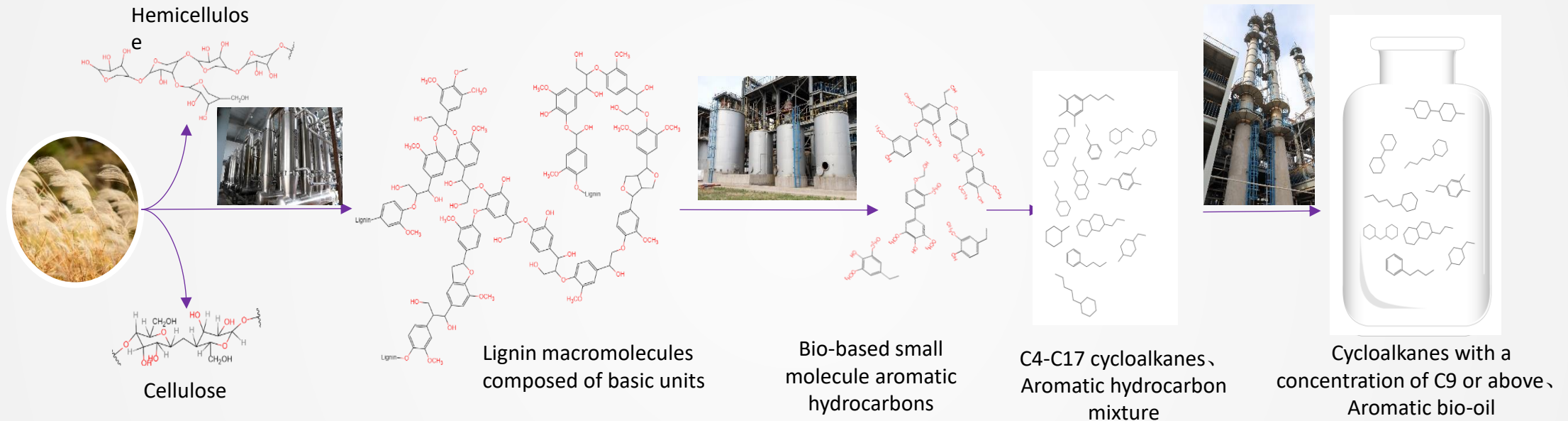
03. SAF Production Route Two

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3. SAF Production Route—Lignin hydrogenation → Thermal stability aviation kerosene

Technical flow of the process



- Under certain temperature and pressure conditions, the internal connecting bonds of lignin macromolecules are broken through catalytic hydrogenation.
- The small molecule aromatic hydrocarbons obtained after bond breaking were further hydrogenated to obtain a mixture of cycloalkanes and aromatics of C4-C17;
- Through solid-liquid separation and distillation purification, bio-oil mainly composed of cycloalkanes and aromatic hydrocarbons of C9 and above is obtained;

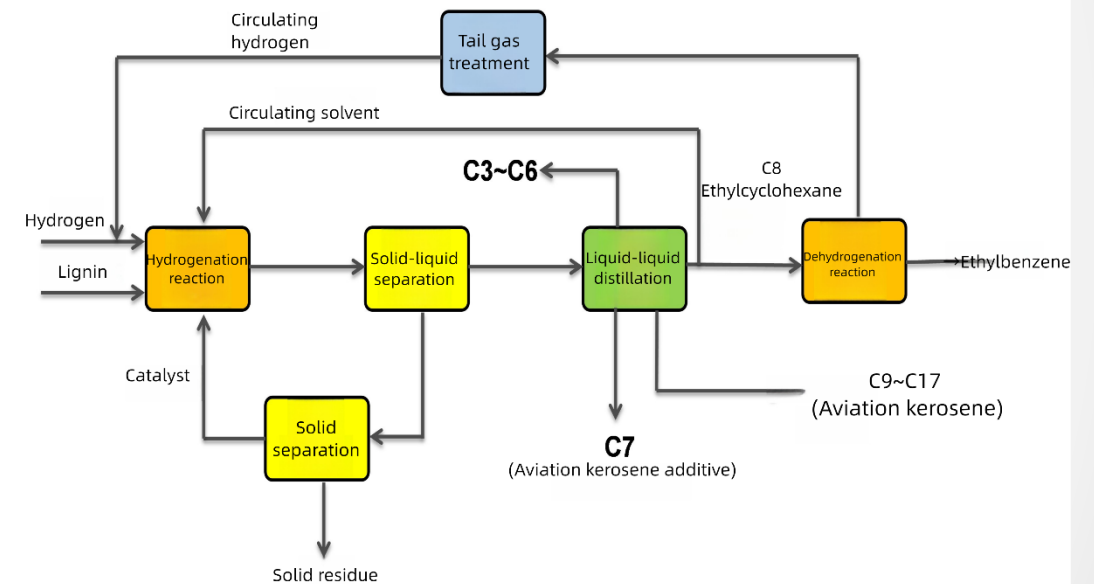
3. SAF Production Route—Lignin hydrogenation → Thermal stability aviation kerosene

Progress in pilot test



Pilot plant for converting thousands of tons of lignin into aviation fuel for high-speed aircraft

Pictorial representation of the process for producing aviation kerosene and ethylbenzene from lignin





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4. The prospect of industrialization—Biomass layout of SQ Group

The development plan for the second phase of Daqing Shengquan

Project investment 6 billion yuan

The total investment of the second-phase project is 6 billion yuan. The construction contents include: hard carbon anode material workshop, bio-based methanol workshop, nanocellulose workshop, Lyocellin fiber workshop, pulp molding workshop, cellulose products workshop, aviation kerosene workshop, flavor and fragrance workshop, and bio-based resin workshop.

Straw can be processed One million tons

The annual processing of agricultural straw has increased to **1 million tons**. The annual production capacity is **80,000 tons** of hard carbon anode materials for batteries, **120,000 tons of bio-based methanol**, **10,000 tons** of nanocellulose, **150,000 tons** of Lyocellin fiber, **50,000 tons** of pulp molding, **290,000 tons** of cellulose products, **10,000 tons of high thermal stability bio-jet fuel (comparable to the US JP-7)**, **8,800 tons** of ethylbenzene, **5,600 tons** of common jet fuel (C1-C6), and flavors and fragrances (ethyl wheat) **6,500 tons** of pofol and **30,000 to 40,000 tons** of bio-based resin.

Annual sales revenue 8 billion yuan

After **the second-phase project** reaches its full production capacity and efficiency, the annual sales revenue will be approximately **8 billion yuan**, the total annual profit and tax will be **1.9 billion yuan**, and **more than 800 local jobs** will be provided.

4. The prospect of industrialization—Biomass layout of SQ Group

The biomass fractionation provides reliable low-value raw materials

The two routes of SQ Group for converting lignin into SAF through the biomass fractionation are both technically feasible and environmentally beneficial.

The two routes complement each other's advantages

The lignin gasification -FT route has been rapidly implemented relying on mature processes, while the hydrogenation route targets the high value-added aromatic hydrocarbon market.

Jointly promote the large-scale application of SAF

In the future, it is necessary to further optimize the catalyst, reduce energy consumption, and coordinate with policies and capital to promote the large-scale application of bio-jet fuel.





THANK YOU
THANKS!

Thanks For Watching

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