



Methanol Cookstoves and Heating

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Section on Energizing the World: Enhancing Energy Access and Rising out of Energy Poverty
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Members



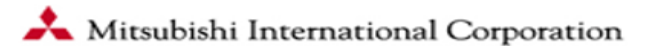
Tier 1



Tier 2



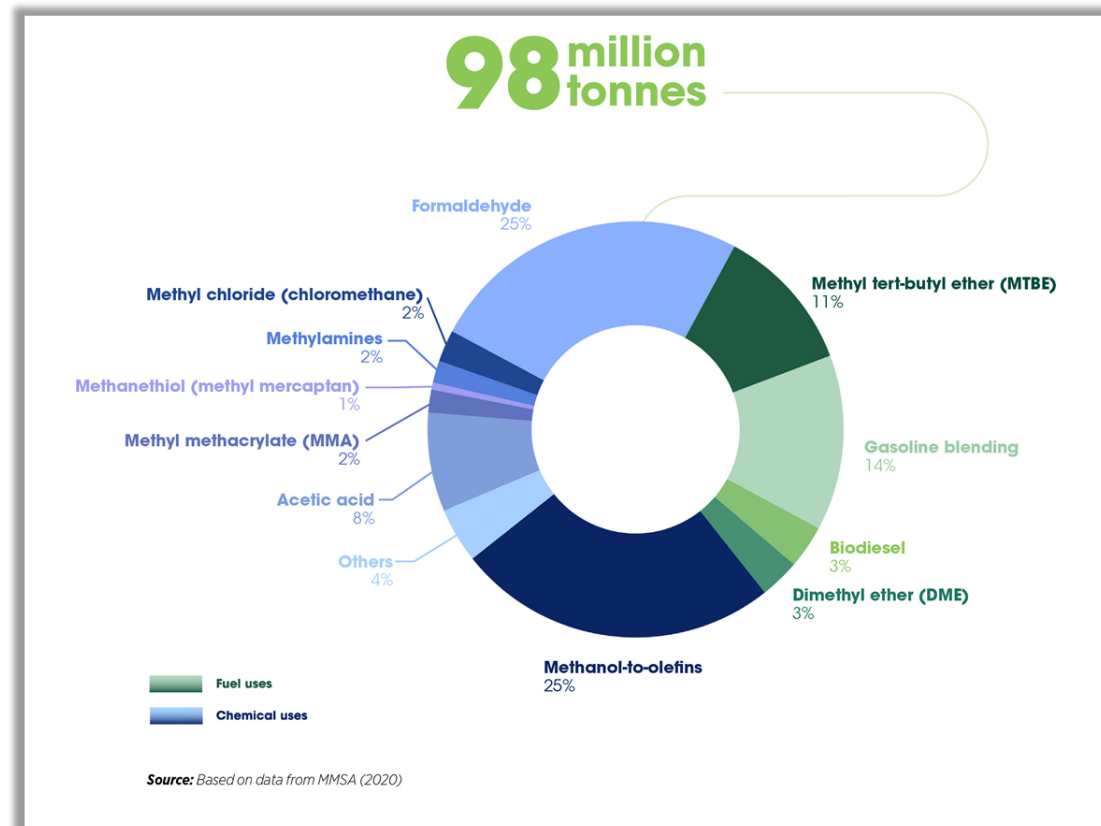
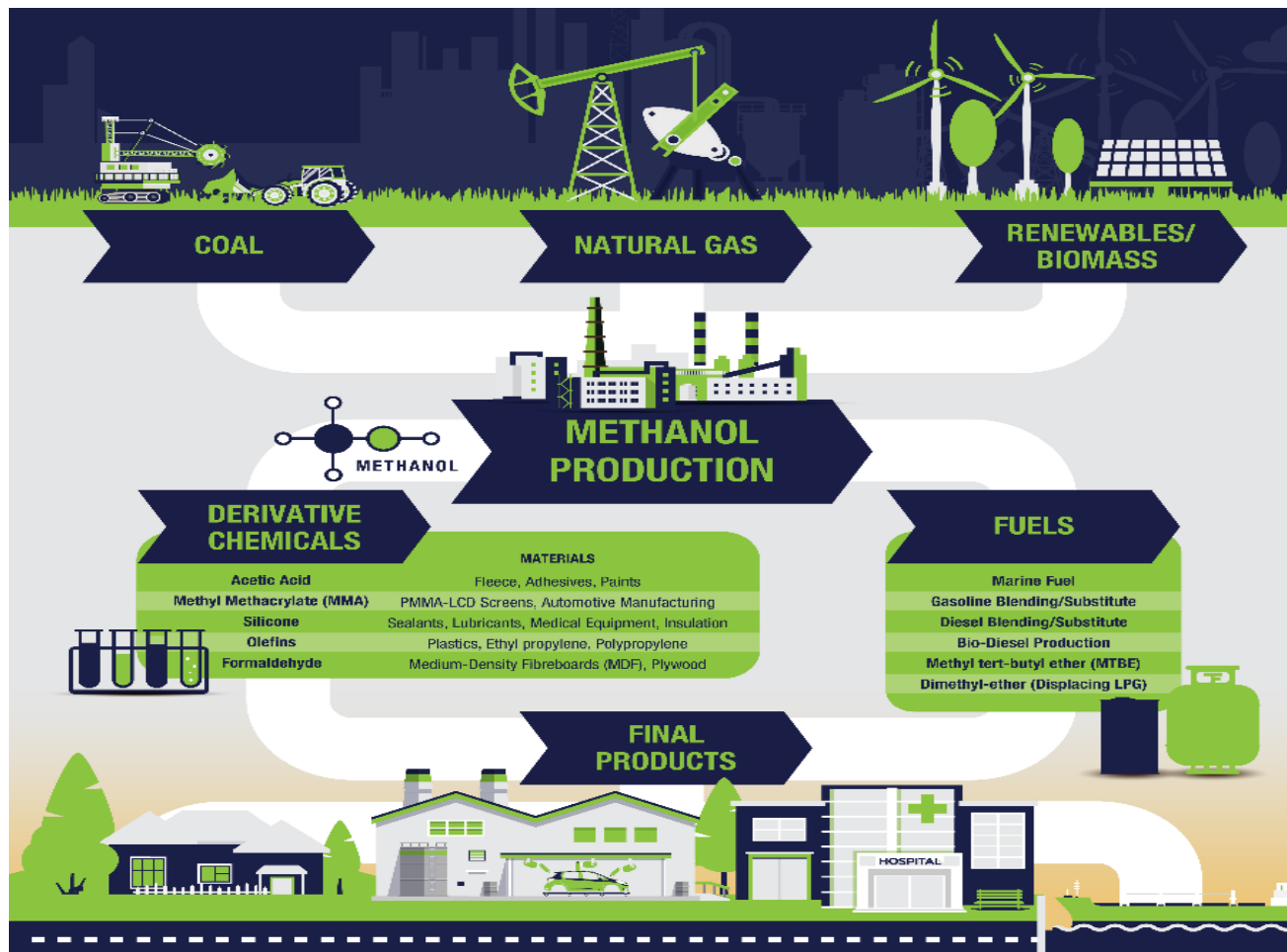
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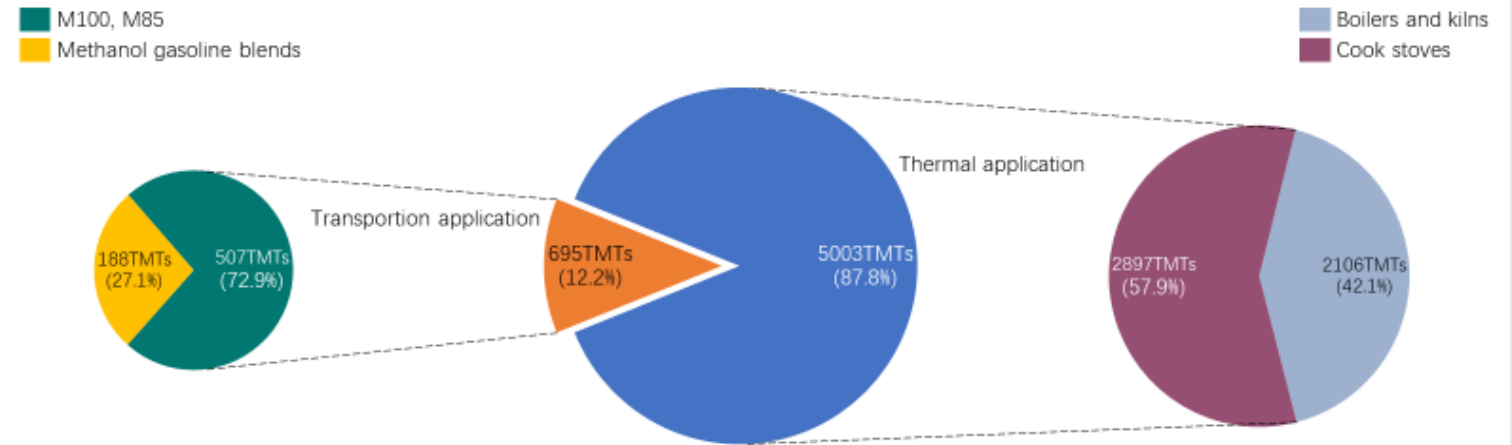
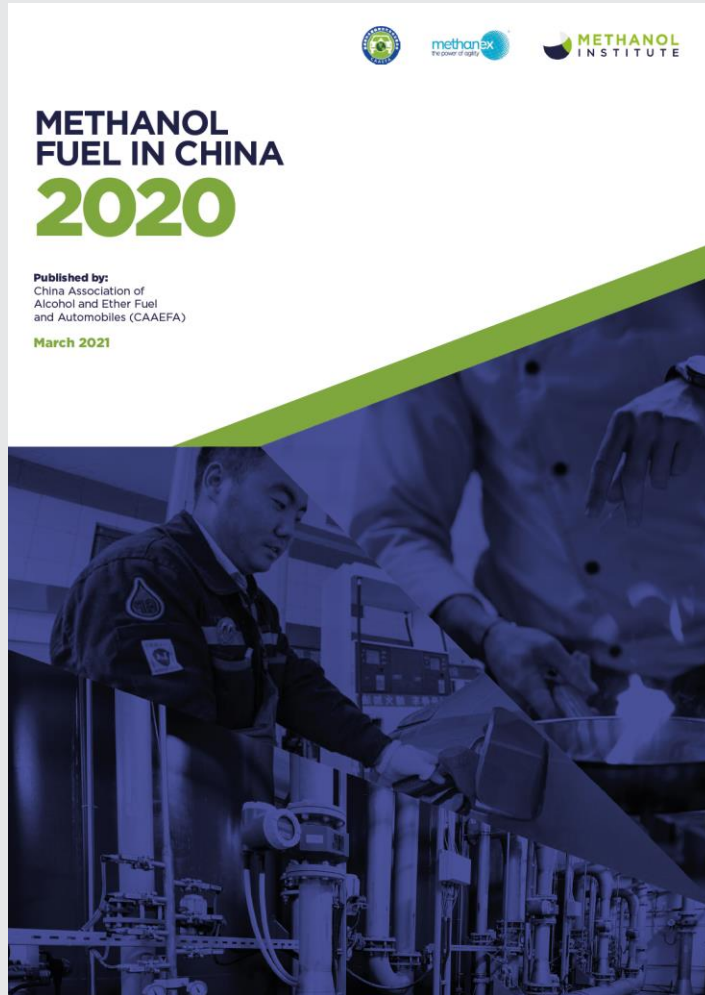


Tier 4



Essential Methanol





- ♦ Transportation fuel includes methanol vehicle fuel M100, M85 and methanol gasoline blending, as well as marine fuel, fuel-cell and other fledgling applications.
- ♦ Thermal application includes boilers, kilns, and cook stoves.
- ♦ The consumption of methanol fuel in transportation accounted for 12.2% of this demand, as well as the consumption of in thermal application accounted for 87.8%

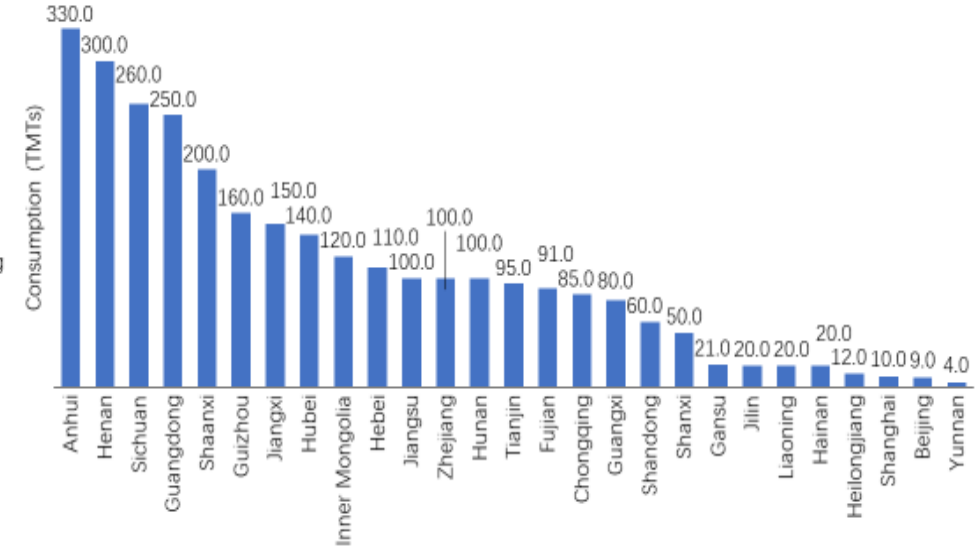
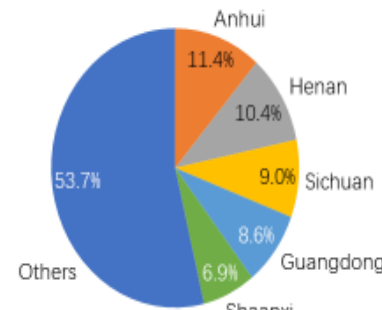
Methanol Cookstoves in China

- A methanol cookstove composed of a methanol fuel storage tank, supply pump, tank, and the stove itself.
- Different forms methanol Cookstoves: Single stove, dual stoves for stir frying, steaming
- Fuel: 100% methanol to methanol blends (emulsified with water), stored in day tank/cylinder for small amount in the kitchen, and large amount stored outside the kitchen
- Widely used in restaurants, central kitchens and also increasing in rural regions: mainly cost driven, to replace LPG and NG (due to safety and cost concerns)

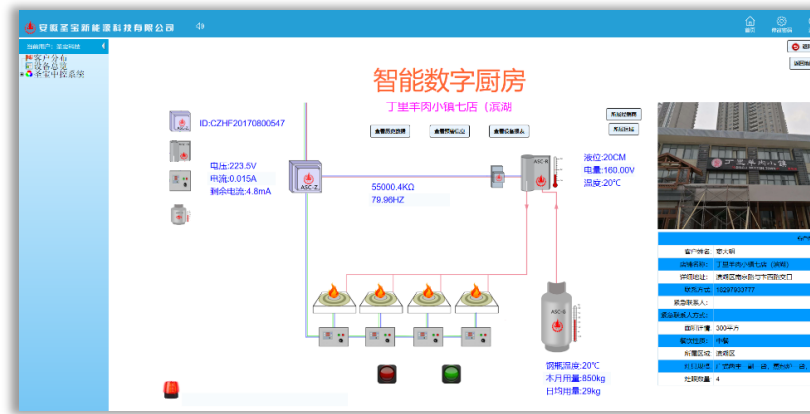
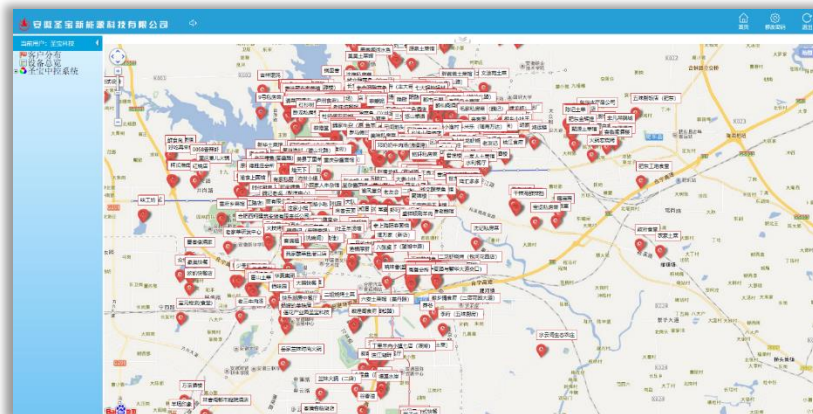


Government Support Methanol Cooking Fuel

- Basic standards on “Alcohol Based Fuel”, complying with two Standards: Alcohol Based Liquid Fuel and Stove for Alcohol based Domestic Fuel NY312-1997
- New Standards are being drafted by industry organizations in China, MI and Methanex
- Regions like Tianjin, Gansu, Shanxi, Shannxi, Guilin and Gansu supportive
- Leading companies with modern technology on safe handling, received government permits



Consumption of methanol fuel in cook stoves of provinces in China in 2019



Methanol Cooking in India

- In 2018, India's methanol manufacturer Assam Petrochemicals Limited (APL) jointly with the government of Assam and national policy think tank NITI Aayog rolled out Cleancook two-burner 315 methanol cookstoves to APL colony residents
- A survey was conducted to measure consumer response to the new stove and fuel by International NGO Project Gaia. Of the 315 homes, 155 were surveyed over a period of 3 months
- Safety of the fuel is of concern to all user and the safety of the methanol stove was especially appreciated in this context
- The compactness and portability of the methanol stove were much valued
- The cookstove offered the flexibility to be cooked with variety of food, with the pots and pans in use in India



APL Residential Community, Namrup cooking on methanol cookstove

Methanol Furnace Home Heating Rural China



- Methanol used in small burners for heating, replacing raw coal for cleaning home heating
- Provinces of He Bei and Shan Xi issued policies to support rural heating, total number over 50,000 households
- Heating in rural places of North China causing serious air pollution, and many replacements to coal in the “Blue Sky Battle” are not satisfied, i.e. electricity price, NG infrastructure in country side
- New Trend to combine cooking and heating using methanol like NG
- **All thermal applications (boilers, kilns and rural heating) contributes 2MMTs in the study**



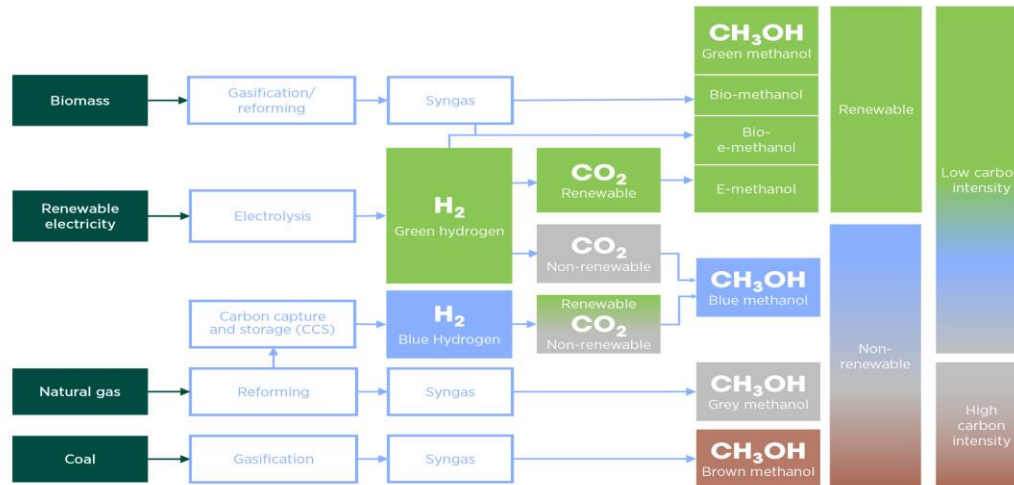
- Agricultural products like mushroom and tobacco drying rooms can be retrofitted to burn methanol to produce exhaust gas for tobacco drying
- Methanol burns clean with high concentration of CO₂ which retains the quality
- Coal and natural gas do not burn as cleanly, coal is also banned in some regions
- Each room is equipped with sensors for CO, NO_x, SO_x, CO₂, temperature etc.
- Each room consumes 2 tons of methanol per season; there are 1.2 million drying rooms in China



Source: Da Wei Energy

Brown, Grey, Blue and Green

Figure 2. Principal methanol production routes



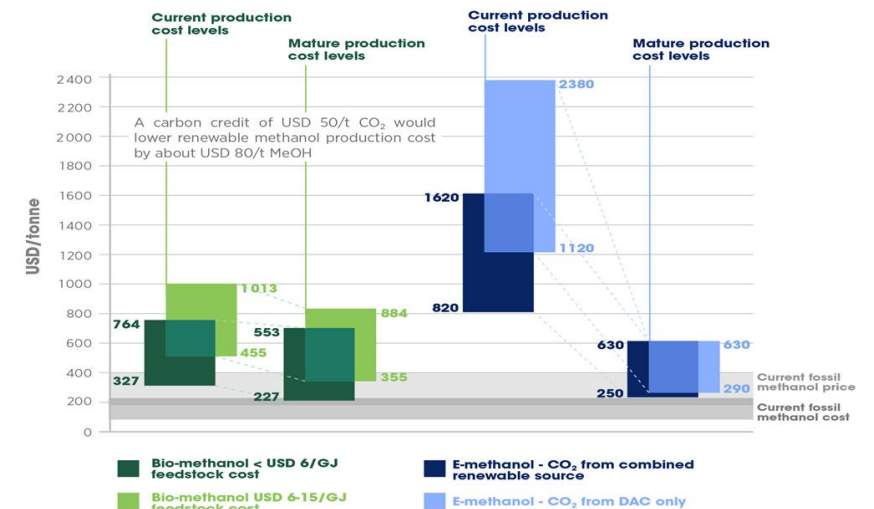
Renewable CO_2 : from bio-origin and through direct air capture (DAC)

Non-renewable CO_2 : from fossil origin, industry

While there is not a standard colour code for the different types of methanol production processes; this illustration of various types of methanol according to feedstock and energy sources is an initial proposition that is meant to be a basis for further discussion with stakeholders



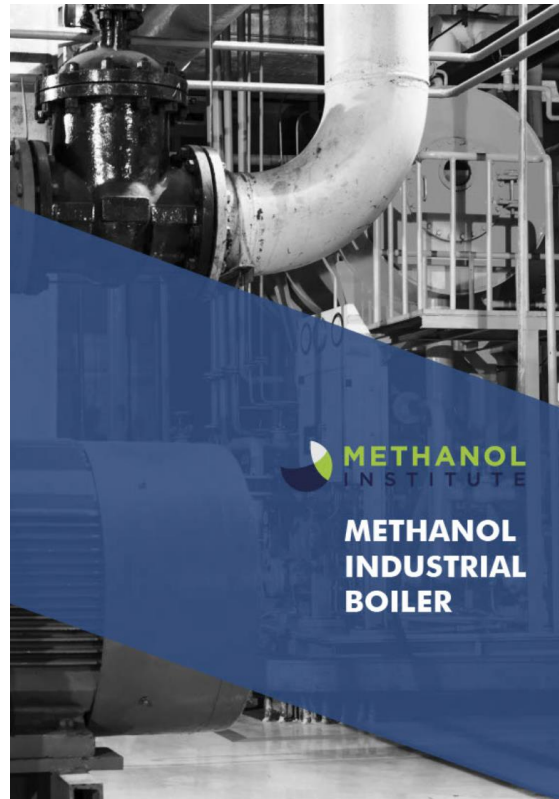
Figure 3. Current and future production costs of bio- and e-methanol



Notes: MeOH = methanol. Costs do not incorporate any carbon credit that might be available. Current fossil methanol cost and price are from coal and natural gas feedstock in 2020. Exchange rate used in this figure is USD 1 = EUR 0.9.

Dedicated page on methanol for heat

<https://www.methanol.org/heat/>



Methanol Cook Stove video



<https://methanol.sharepoint.com/:v:/g/EWDtqAM8h9tBpTrWlyLyUbABGHj-mjXs6x1TgwNnlVgOvA?e=997WUf>

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THANK YOU
谢谢