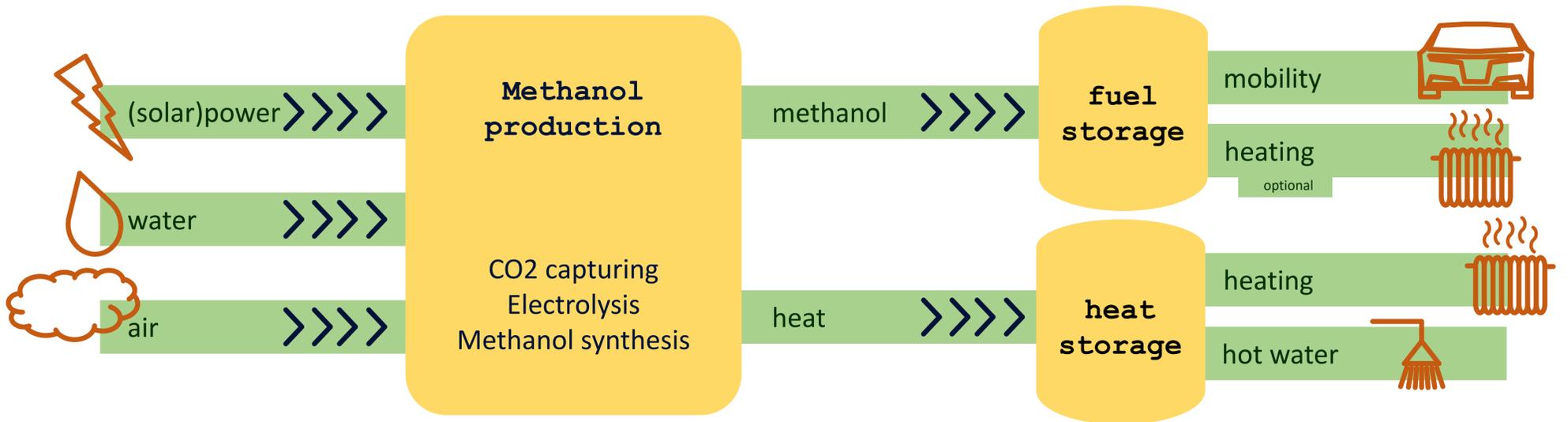


# CARBONOL

**"home-grown fuel for everyone"**

*the only solution for CO2-neutral heating and mobility without any compromise in comfort and availability*



## Why does it work?

- SIZE** go large - if a consumer uses more than 100 mWh/year, electricity can be bought directly and therefore will be cheaper (apartment buildings/ neighbourhoods instead of single-family houses)
- PV** use solar power during the day and low fare electricity during the night
- HEAT PUMP** to profit from its COP
- WASTE HEAT** use process waste heat (exothermic processes feed endothermic)
- REUSE HEAT** from sewage water
- DECENTRALIZED** production on site reduces logistics costs and increases availability
- EFFICIENCY** use a fuel efficient (hybrid) cars
- INSULATION** use proper building insulation to reduce kWh/a/m<sup>2</sup>

## Benefits

### Society

- An alternative in mobility which is CO<sub>2</sub> neutral, as other solutions, but does not require a gigantic investment in the infrastructure.

### Investor

- Methanol market can grow slowly. There is no "cars first vs. infrastructure first" as in electric or hydrogen car sector. The gasoline infrastructure can stay the same and slowly switch to methanol.
- An investor puts his money to a sector where he does not have to wait for another sector that enables his investment to be successful in the first place.

### Energy supplier

- Green electricity is very irregular in its production and hard to store. Methanol can solve that problem
- With this new solution the consumption of electricity will mainly be over night while solar power is used during the day. This helps the suppliers to even out consumption and production.

### End user

- To be CO<sub>2</sub> neutral in mobility without the disadvantages of an electric or hydrogen car.
- To be CO<sub>2</sub> neutral in heating as well

### Car builder

- Car manufacturers should love flex fuel vehicles because they are almost the same as regular cars. No value destruction in a 100 year industry

### petrol station providers ● Ongoing business for liquid fuels

## Why flex fuel cars?

### Flex fuel vs. electrical

- Higher (unlimited) range with fuel compared to battery driven electric cars
- Any regular gasoline station can be used with a Flex Fuel Car
- Refueling takes very little time compared to charging a battery
- A battery driven car has efficiency/range problems in winter when it is cold
- In winter a battery driven vehicle can only be heated with a massive loss of range
- A battery driven vehicle needs intensive planning for charging on long distance travel
- If a battery driven car shall be charged with solar power in the garage at home, a large extra battery is needed to deliver solar power during night time
- A Flex Fuel Car has a similar price to a normal car, an electric car costs around 53 % more

|          |                             |          |
|----------|-----------------------------|----------|
| Example: | VW E-Golf                   | 34'900.- |
|          | VW Golf 1.0 TSI (flex fuel) | 22'850.- |

### Flex fuel vs. hydrogen

- There is no (and will be no in the next few years) hydrogen station infrastructure
- Even the newest generation fuel cells have a small lifespan
- Fuel cells are still very expensive

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