

Sweden

**Virtual Business Meeting in Pully, Switzerland
9 - 11 September 2020**

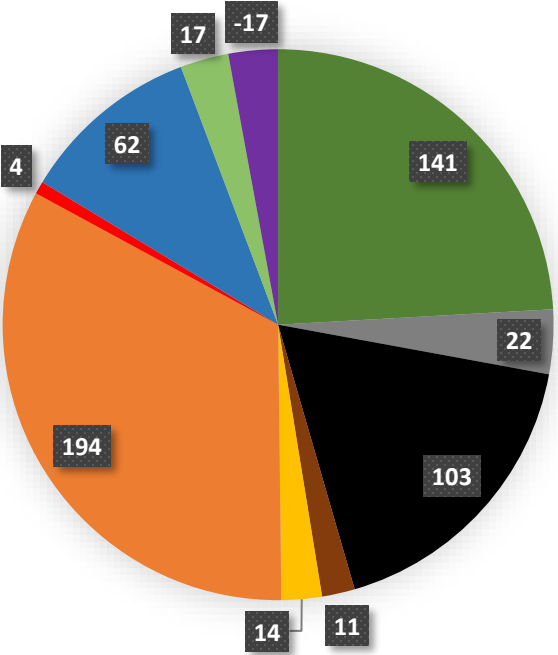
Jonas Ammenberg

Country report

Update on Sweden, focusing on 2018-2019 (-2020)

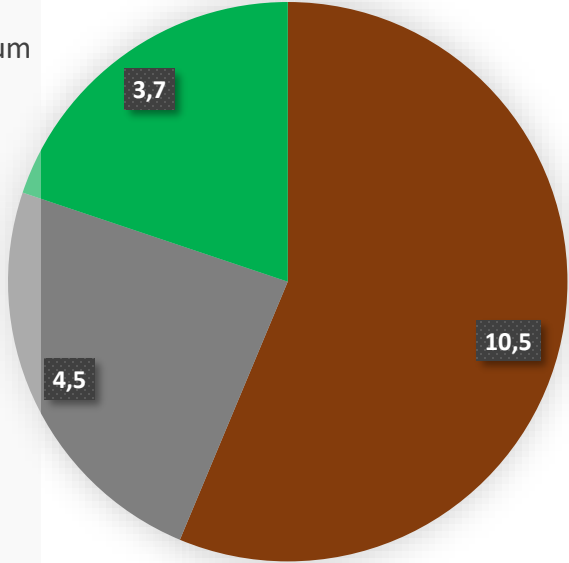
Energy supply & deliveries of energy gases, 2018

Energy supply 2018: 552 TWh



- Biomass
- Coal and coke
- Crude oil and petroleum products
- Natural gas, gasworks gas
- Other fuels
- Nuclear fuel
- Primary heat
- Hydropower
- Windpower
- Net electricity import

Use of energy gases 2018/2019: 18,5 TWh



- Natural gas
- LPG
- Biogas

Source: Swedish Energy Agency, 2020.

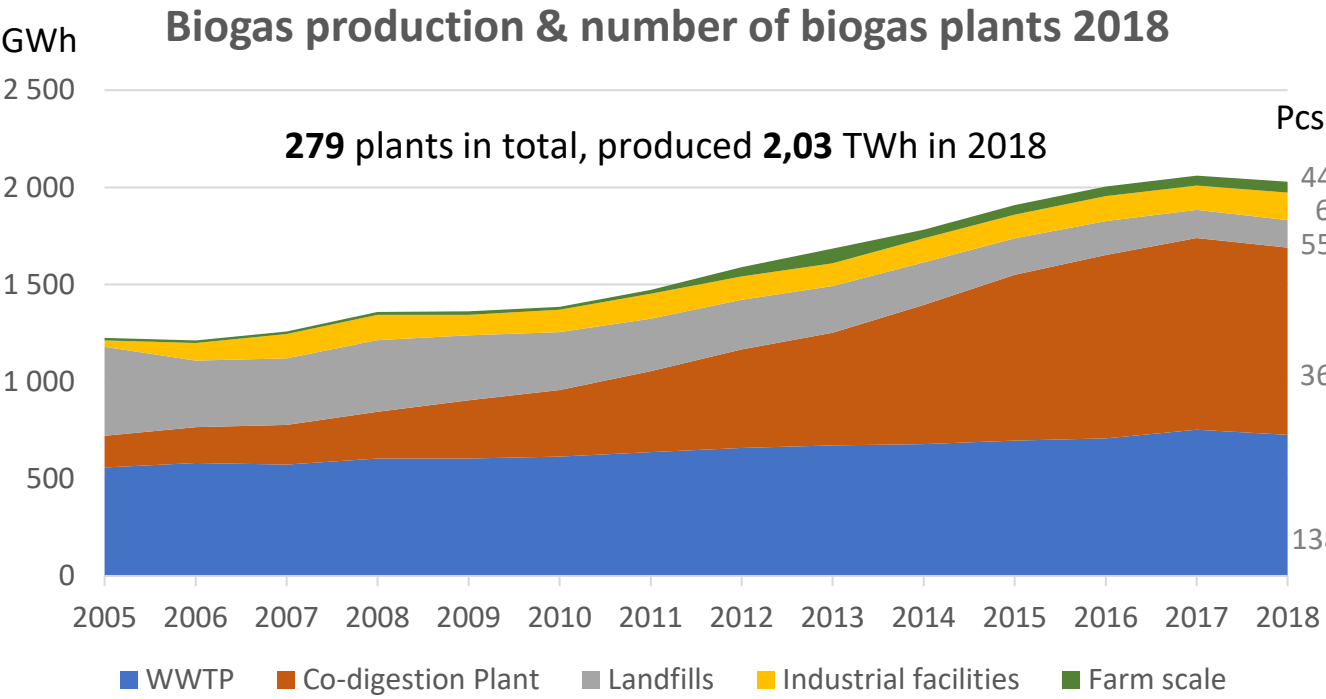
Source: Statistics from the Swedish Gas Association, 2019

25% fossil energy

Low share/levels of gas



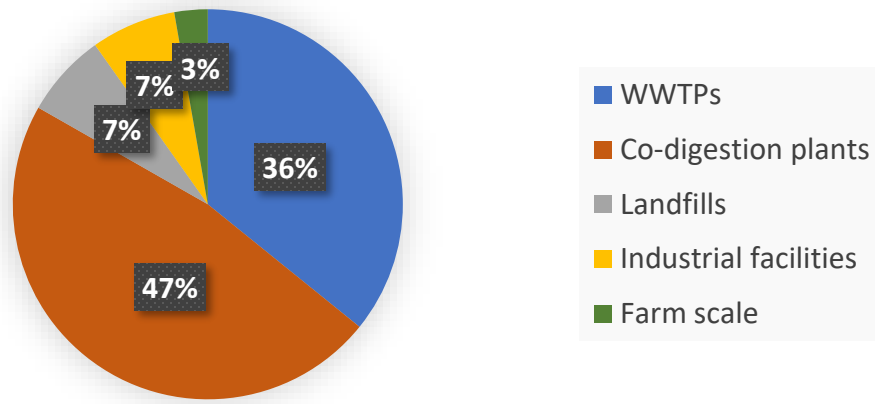
Production of biogas, 2018



Excluding 1 pilot gasification plant

In addition: about 2 TWh/y imported from Denmark (mainly) and a few other countries

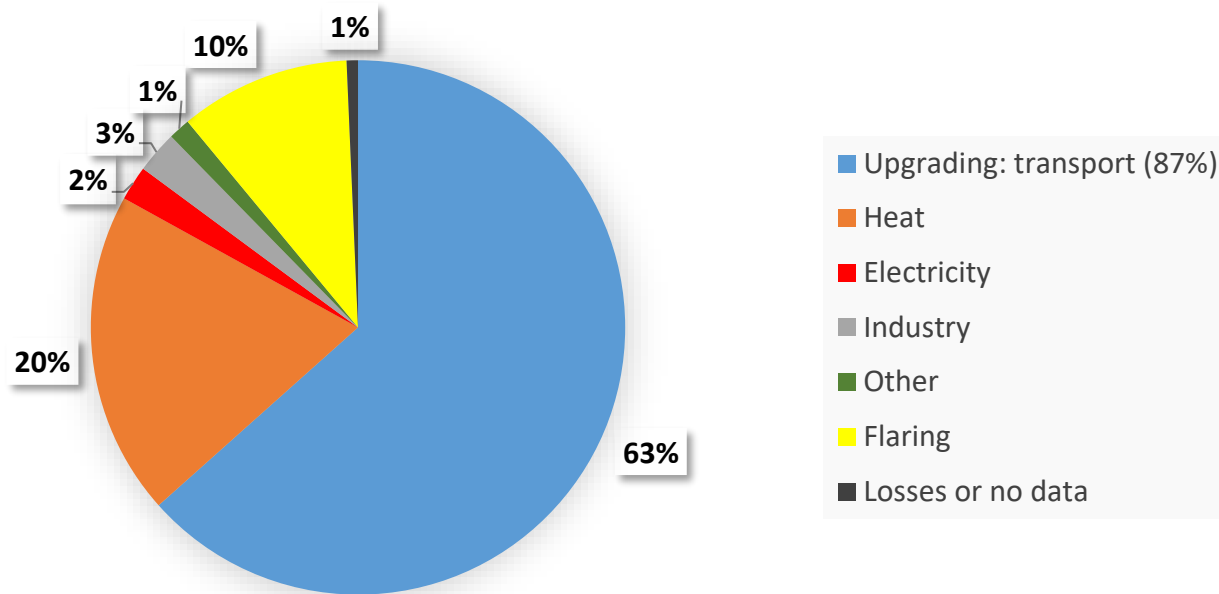
Share of production from different types of biogas plants



Source: Swedish Energy Agency & Swedish Gas Association

Utilization of biogas, 2018

Utilization of biogas produced in Sweden, 2018

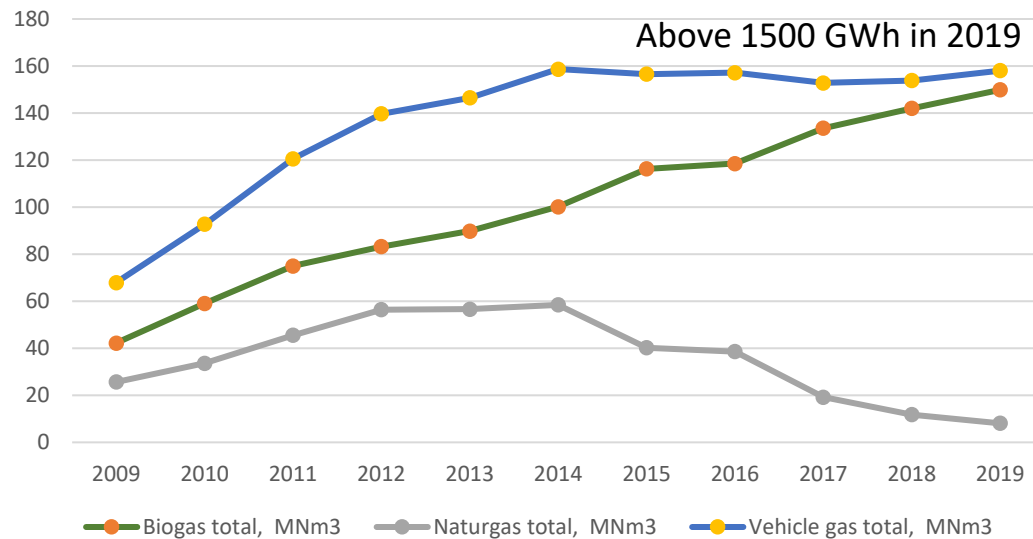


About 30% of the imported gas (443 GWh/y) is used as vehicle fuel

Source: Swedish Energy Agency and Swedish Gas Association

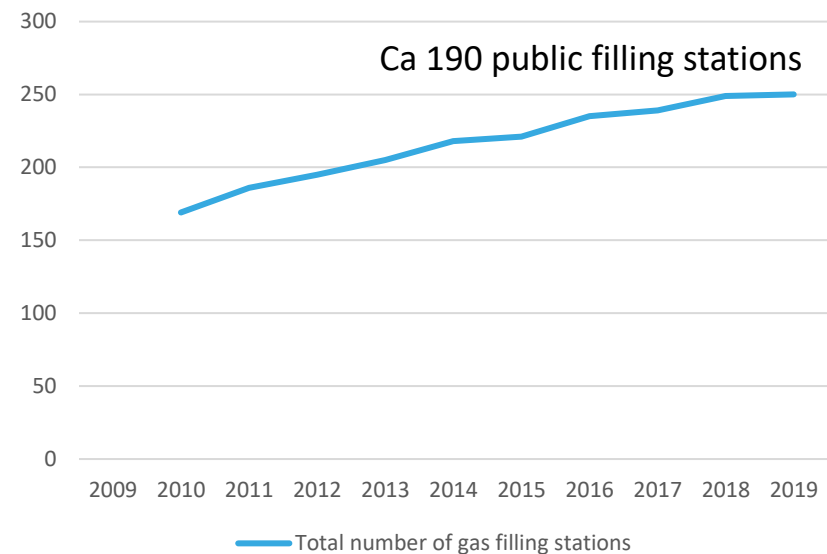
Development regarding gas as vehicle fuel

Deliveries of gas as vehicle fuel, 2009-2019 (MNm³)



- Reached 95% biogas (in 2020).
- Liquified biomethane has entered the market (vehicles & fuels)

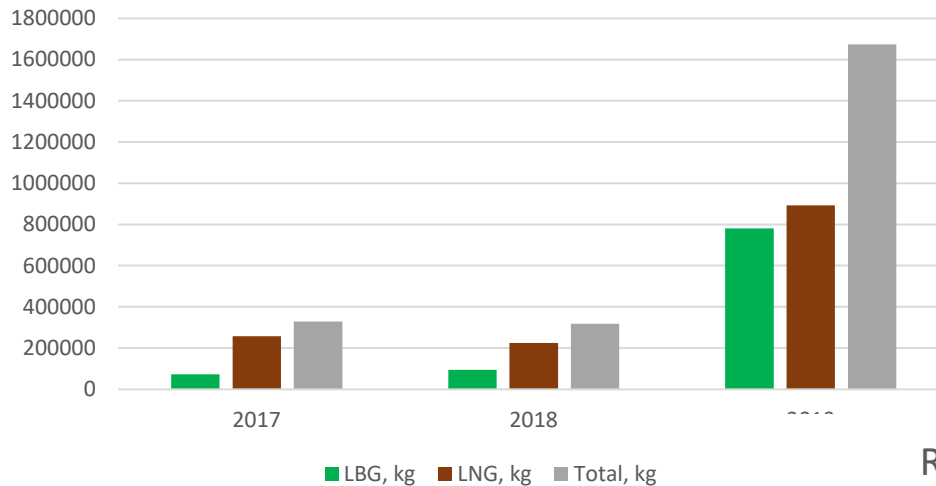
Total number of gas filling stations



Source: Statistics Sweden (SCB)

Development regarding gas as liquified fuel

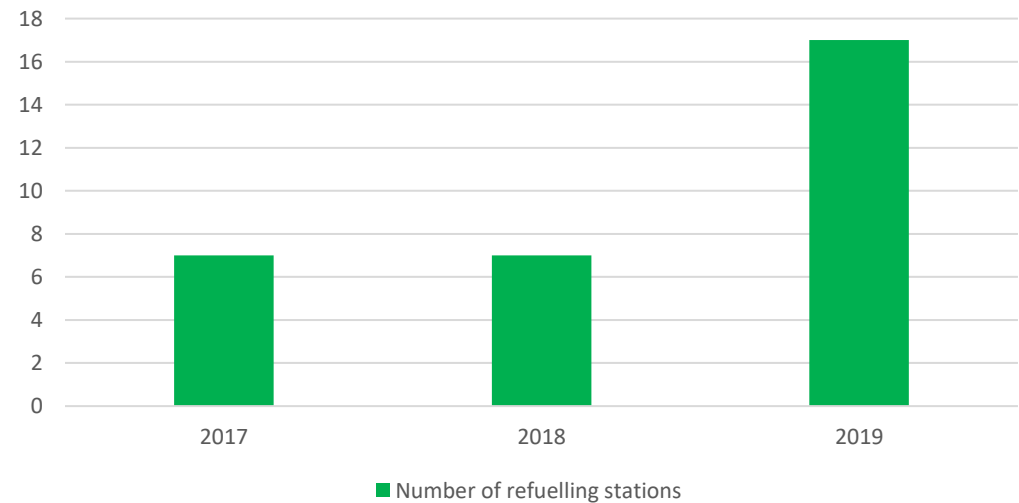
Deliveries of liquified gas fuels



Source: Statistics Sweden (SCB)

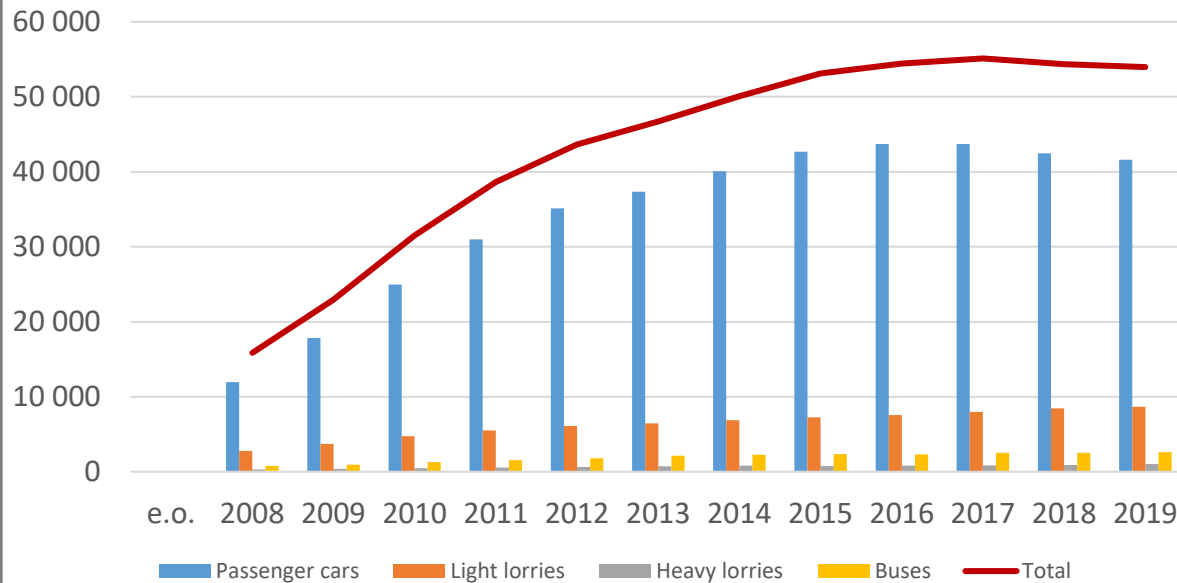
Source: Swedish Gas Association

Refueling stations for liquified gas (LBG/LNG)



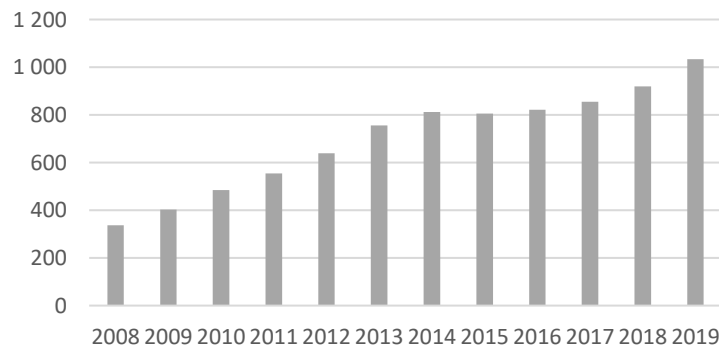
Development regarding gas vehicles

Gas vehicle development, 2008-2019



- Ca 54 000 gas vehicles:
 - ✓ 42 000 pass. cars
 - ✓ 8 500 light lorries
 - ✓ 2 600 buses
 - ✓ **1000+ heavy lorries**
- A shift in focus to electric vehicles (EV):
 - ✓ Policy best for (EV), but ok for gas
 - ✓ Fewer good gas pass. vehicle models
 - ✓ Promising regarding HDV and LBG
- A large share of second-hand gas vehicles sold to Finland & the Czech republic

Heavy lorries, upscaled



Sources: Statistics Sweden (SCB) & Transport Analysis

Digestate management

- About 2.8 Mtonnes of digestate in 2018:
 - 86% as biofertilizer in agriculture
- Almost 100 % as biofertilizer from co-digestion plants and farm-scale plants.
- About 40 % as biofertilizer from WWTPs

Source: Swedish Energy Agency & Swedish Gas Association

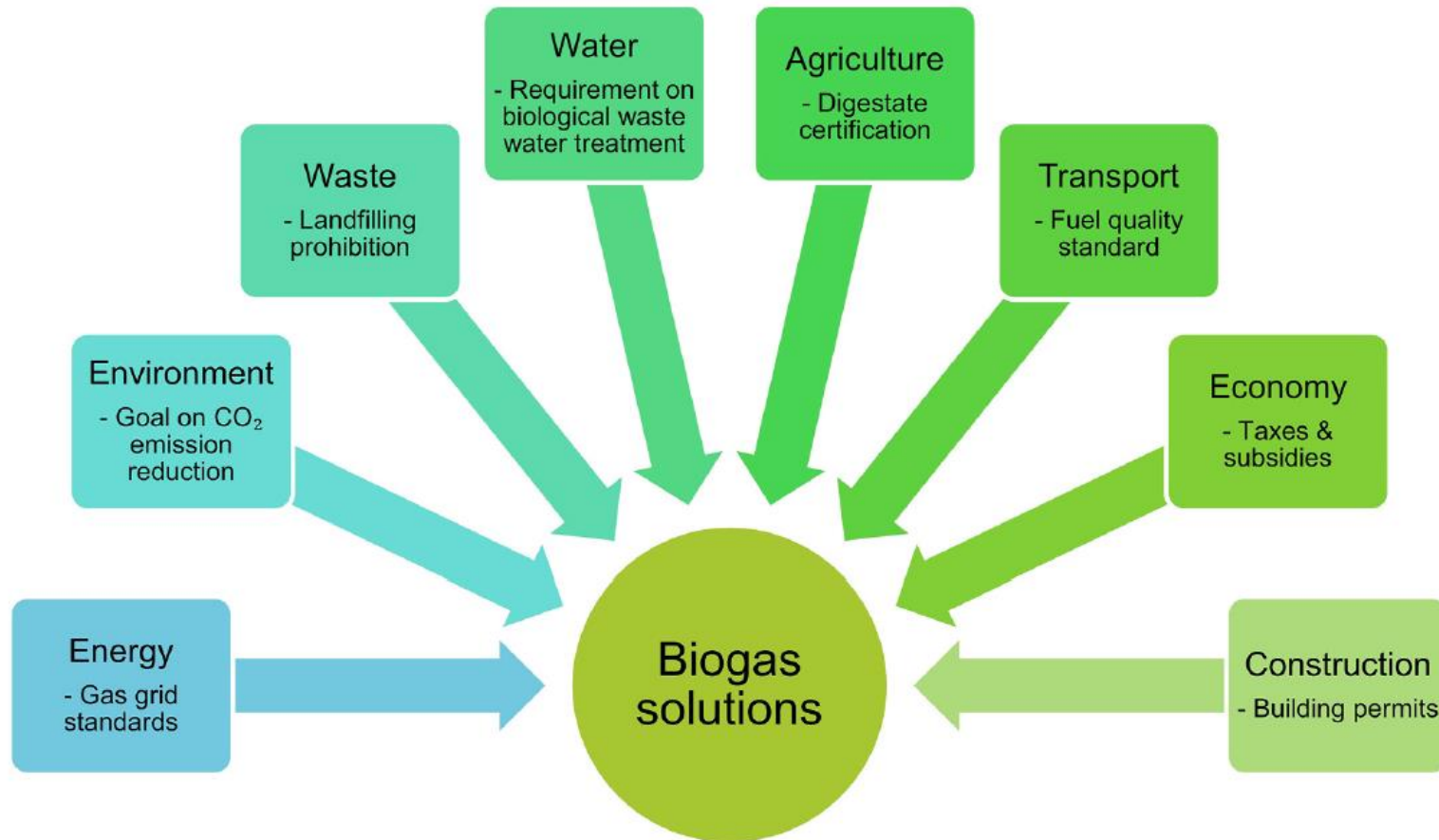
Development

- The Swedish Biogas Research Center released a book in 2019 on the role of biogas in a sustainable society, comprising examples of innovative biogas projects in Sweden and in Norway

<https://biogasresearchcenter.se/order-book-biogas-in-the-sustainable-society/?lang=en> (english version)



The institutional conditions for biogas



Source: Gustafsson and Anderberg, 2021
New article from BRC

Policy

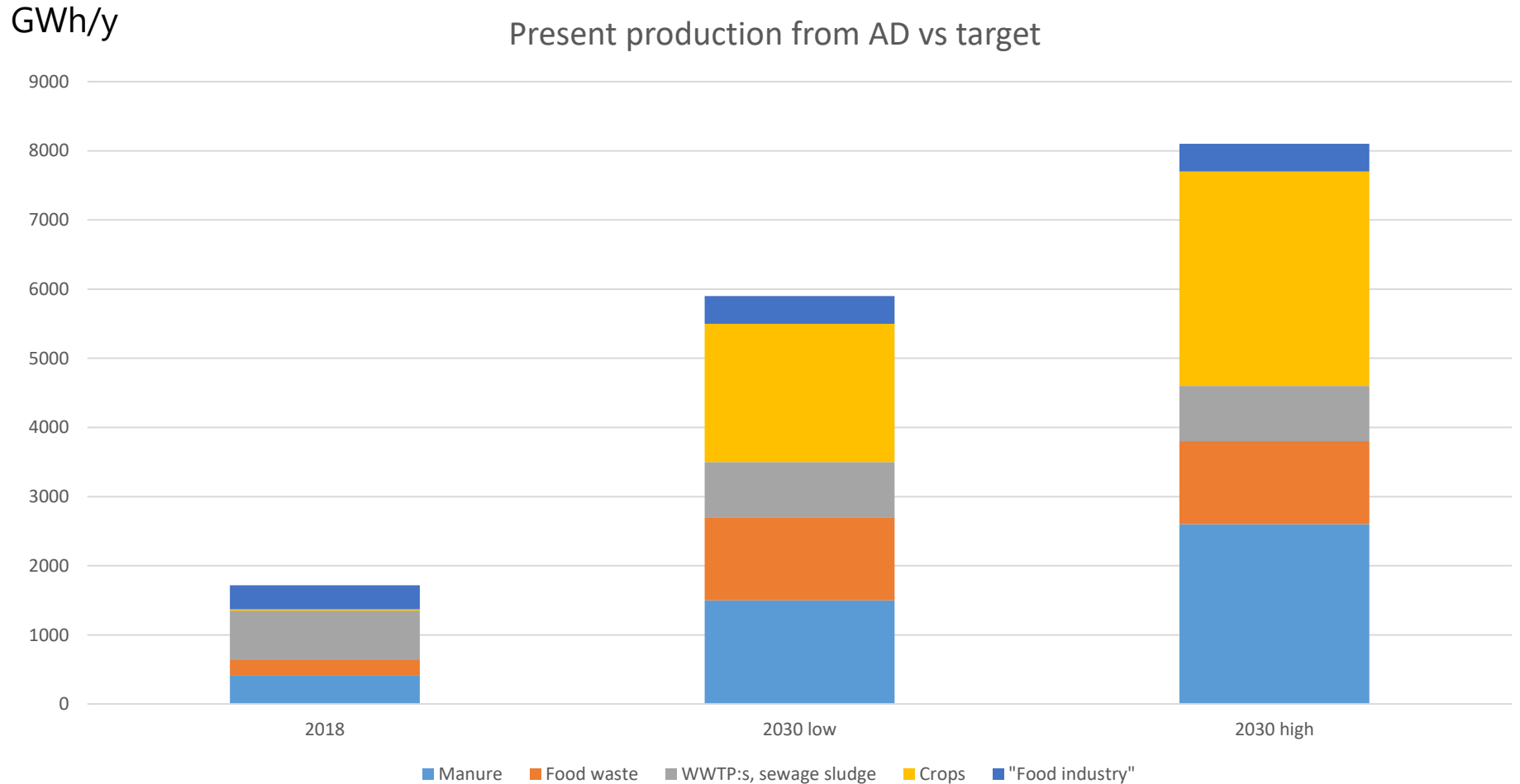
- New policy:
 - Bonus-malus (cars with low CO₂ emissions get a bonus, while cars with high CO₂ emissions get a punitive tax. EV highest bonus)
 - Municipal environmental zones – gas vehicles allowed in the most restricted zones (zone 3)
 - Quota obligation for biofuels in gasoline and diesel from July 1st, 2018

Policy – future

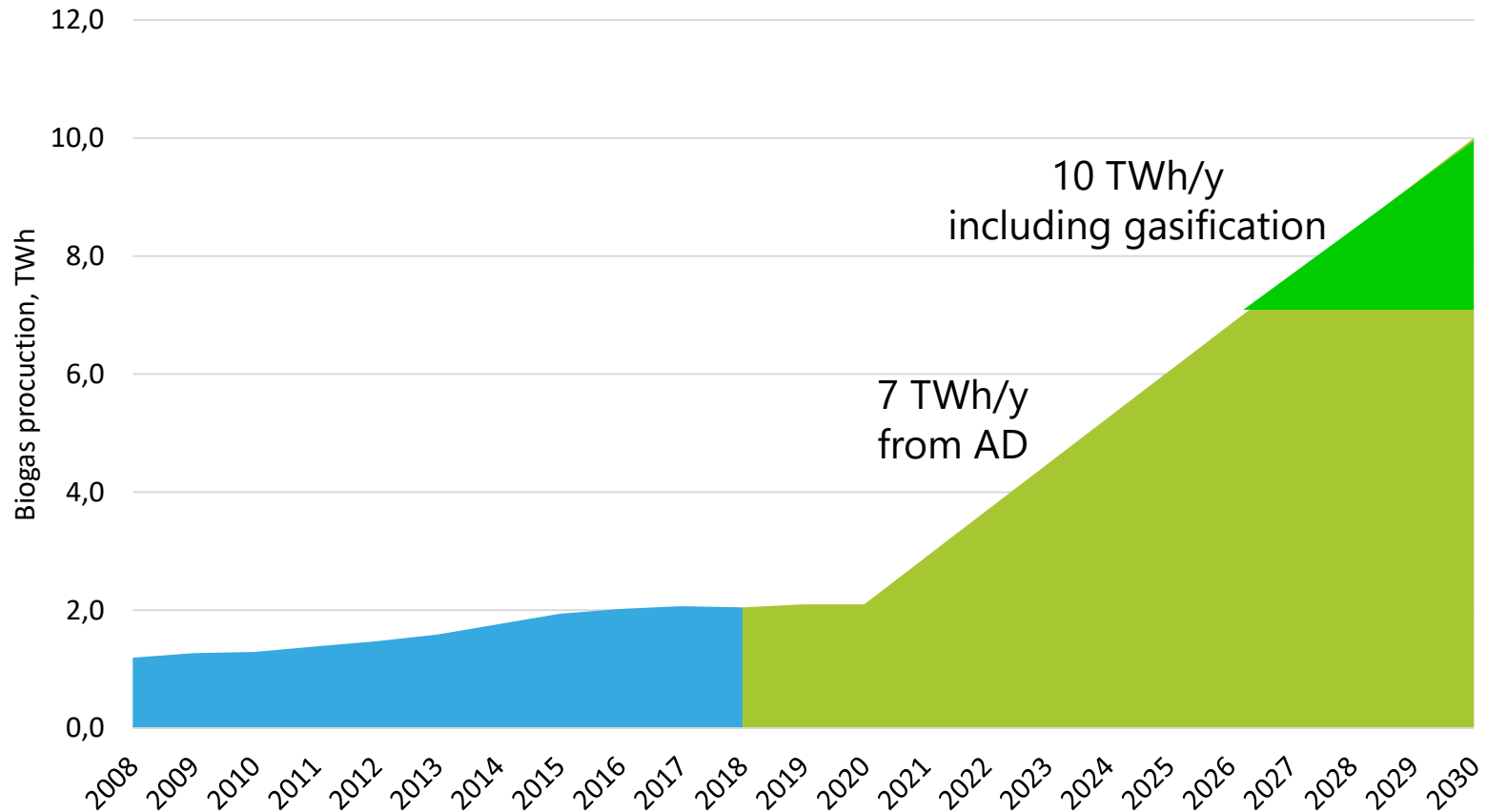
- About 30% increased use of biogas 2017 and 2018, mainly due to imported gas from Denmark (and a few other countries).
 - Sweden has tax exemption for users, while other EU countries have production support → double subsidies → prices similar to natural gas for heating/industry
- Enquiry into market conditions for the Swedish biogas sector;
More biogas! For a sustainable Sweden:
 - 676 pages!
 - Investigation of the most suitable long-term policies for biogas and biomethane after 2020
 - New legal texts suggested → hoping for a rapid implementation
 - Focus on the production side

Production target

7 TWh/y 2030 from anaerobic digestion



Production target perspective



Source: Marcus Gustafsson

Main support suggested

Package I:

- Continued production support for manure-based biogas: ~ € 0.040 per kWh
- Upgrading support: ~ € 0.020–0.030 per kWh
- Liquefaction support: ~ € 0.010–0.015 per kWh

Upgrading -
biomethane for
transport & industry!

Package II:

- Beneficial financial instruments (loans, guarantees)
- Some kind of production support (other energy gases/technologies, i.e. not AD)?
- Ten years support period



www.biogasresearchcenter.se