Biogas report from Austria: Possible phase out of FIT and perspectives how to proceed

BIOMETHANE WS: Trebon 06.10.2017

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This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Developement of biogas and biomethane in Austria

- CHP
  - ~ 290 plants producing electricity and heat
  - ~ 550 $GWh_{el.}$ + 300 $GWh_{th.}$
- Biomethane production
  - 14 plants have installed an upgrading system and connection to the gas grid
  - ~ 2500 m³ installed capacity
  - ~ 15 Mio Nm³ biomethane
  - One plant is running to treat spent grain and produce steam and heat directly at the plant (brewery)

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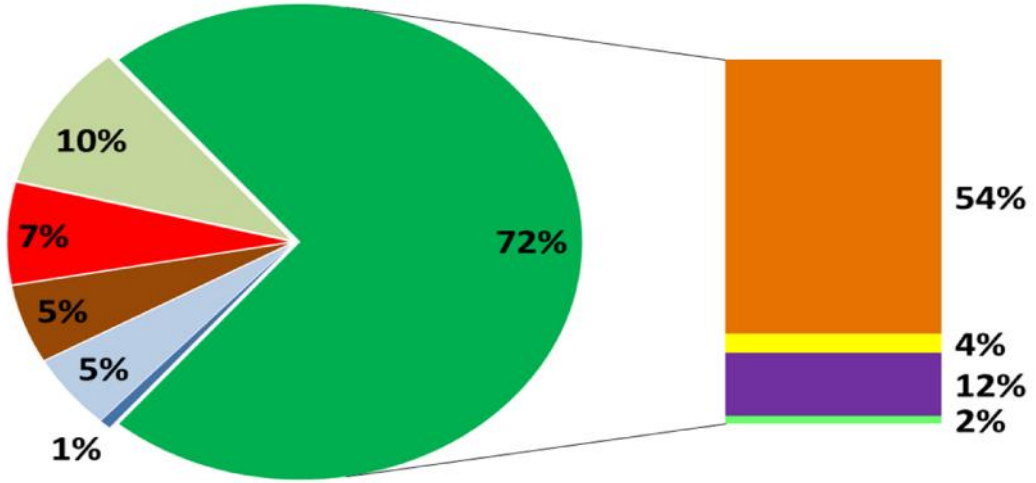
Share of currently used feed stock



- NAWARO kaskadische Nutzung
- Wirtschaftsdünger
- NAWARO vom Dauergrünland
- Mais
- Ganzpflanzensilagen (exkl. Mais)
- Substrate nach Stoffliste
- biogene Abfälle
- NAWARO vom Ackerland
- Ackerfutterpflanzen - Leguminosen
- sonstige

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Amendment of renewable energy act in June 2017: Post feed in tariff for existing plants

- ~ 2/3 of existing plants may receive post feed in tariff at first stage for 3 additional years – then a one time extension can be applied if rules for new plants will be fulfilled
- preconditions
  - Remote control avoiding grid overcapacity
  - Energy efficiency: > 60 % (electricity and heat)
  - Feedstock: max. 60 % corn and cereals (mass balance)
- Selection of most efficient plants
  - Via energy efficiency (from 2016) + Full load hours (average: 2010 - 2016)

➔Government wants to keep only most efficient plants in operation which are willing to reduce corn and cereals as main feedstock

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Amendment of renewable energy act in June 2017: new plants

- preconditions
  - Remote control avoiding grid overcapacity
  - Feedstock: max. 30 % corn and cereals (mass balance)
- Two options
  - Plants smaller 150 kW el. With direct CHP + Energy efficiency: > 67,5 % (electricity and heat)
  - All bigger plants only with upgrading, grid injection and electricity production after transport via official gas grid

➔Only small plants shall have the CHP directly at the plant and support grid stability

➔Due to expected huge increase of electricity from wind and solar bigger biogas plants shall inject to gas grid, gas grid used as efficient storage and the conversion to electricity “shall happen when other renewables cannot secure demand”

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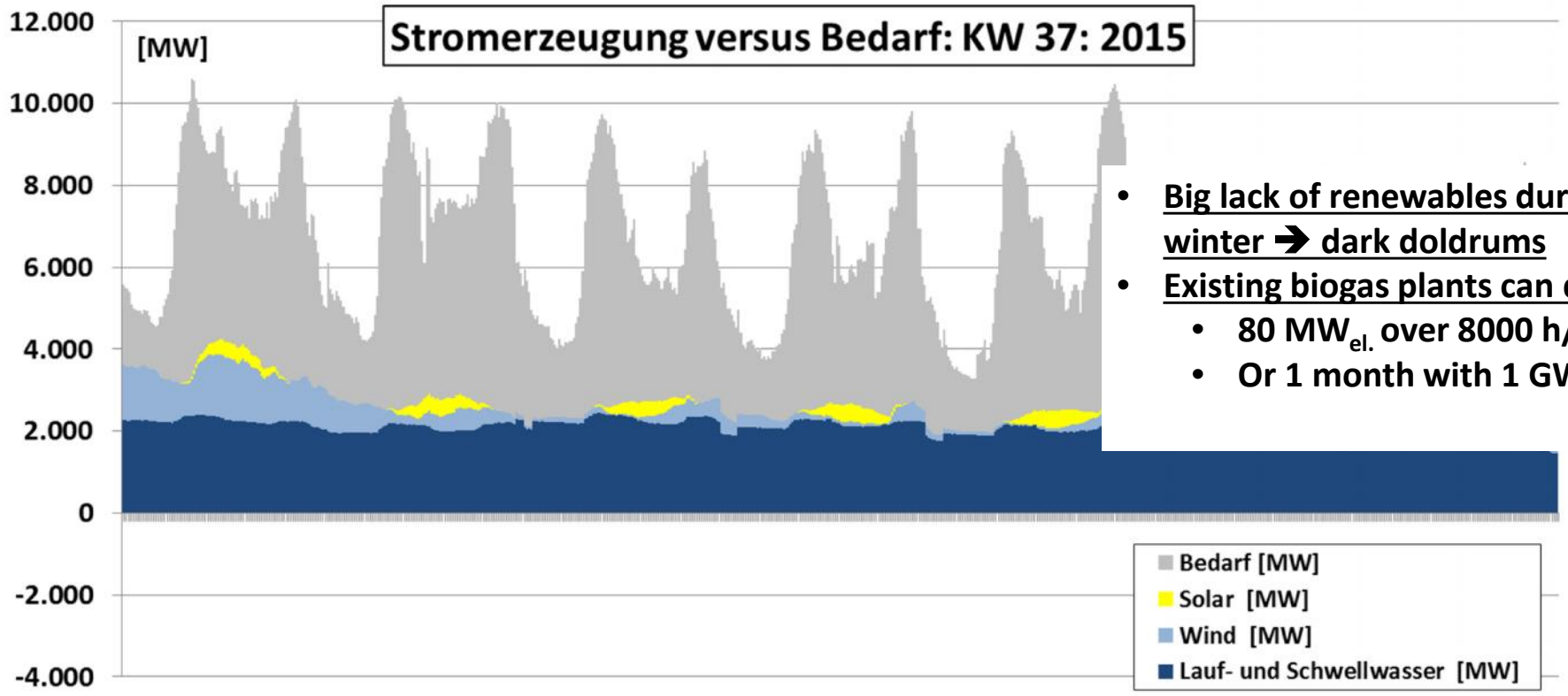
What we know I: Future potential from bio waste , waste from farm land and farm fertilizer

	Current total use [ha]	percentage f Biogas	[kg TS / ha]	[GWh]	Possible applications	
					Mio. Nm^3 CH4	MWel. bei 8000 bj
Straw from corn	200 000	30	6 000	900	90	40
Straw from winter rape	53 000	30	4 000	150	15	10
Straw from other cereals	520 000	20	3 500	800	80	40
Catch crops	1.4 Mio.	7	3 500	800	80	40
grassland	570 000	3	5 000	300	30	20
farmfertilizer	20 % von cattle and hogs 40 % des poultry			1 700	170	80
Potential from bio waste				700	70	30
Total potential (non crop based)				**5 350**	**535**	**260**

Union's Horizon 2020 research and innovation programme.

What we know II: Electricity production versus demand



- **Big lack of renewables during winter ➔ dark doldrums**
- **Existing biogas plants can deliver**
  - **80 $MW_{el.}$ over 8000 h/a**
  - **Or 1 month with 1 $GW_{el.}$**

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What we know III: Austrian gas demand (2015, rounded)

		[PJ]	[GWh]	[Mio Nm³ CH_4]	[%]
total		300	83 000	8 300	100
thereof					
internal consumption		12	3 300	330	4
non energetic use		14	4 000	400	5
CHP and district heating		83	23 000	2 300	28
heat		191	53 000	5 300	64
thereof					100
	production	111	30 000	3 000	58
	traffic	11	3 200	320	6
	trade	21	5 800	580	11
	Private households	48	13 000	1 300	25

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What we know IV: Austrian gas demand (2015, rounded)

- Heating demand is ~ 1 300 billion m^3 CH_4
- Mostly situated in urban with
  - Historical buildings which have low opportunities to insulate their buildings and lower their heat demand
  - Low opportunities to change their energy system or even becoming self sufficient
- Best opportunity changing to renewables is via biomethane

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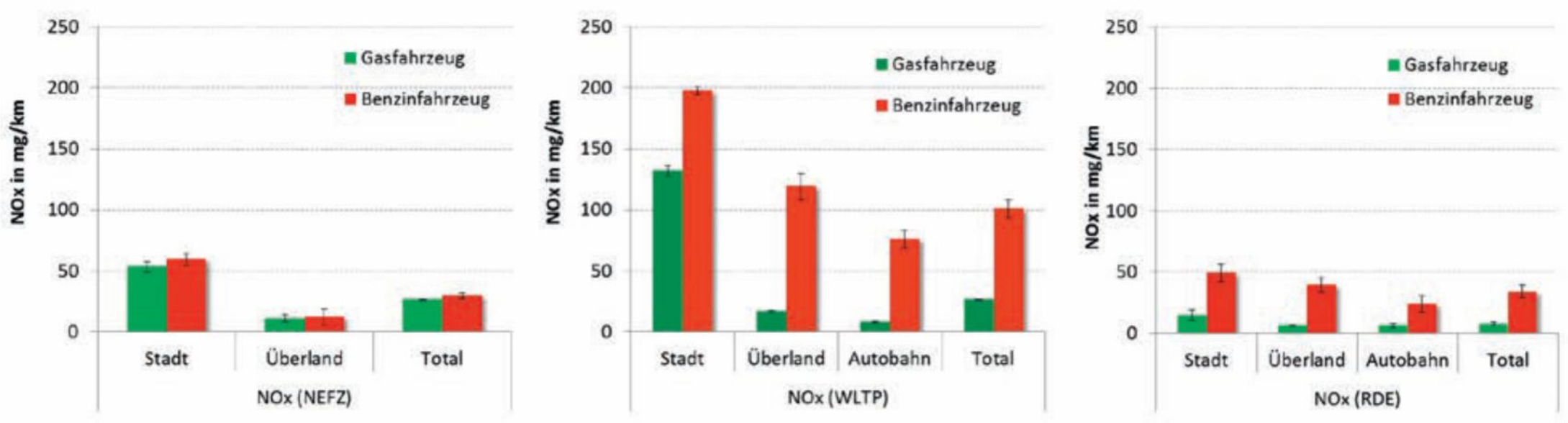
What we know V: CNG/CBG: best way reaching future emission restrictions



Source: EMPA - CH

- NEFZ: New european driving cyclus
- WLTP: Worldwide harmonized Light vehicles Test Procedure
- RDE: Real driving emissios

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What we know VI: CNG/CBG: best way reaching future emission restrictions

- After e mobility hype we hope coming back to an technical discussion on options for transport sector
- Existing engine technique reaches already EURO 6d by using CNG/CBG
- With CBG also CO_2 could be mitigated

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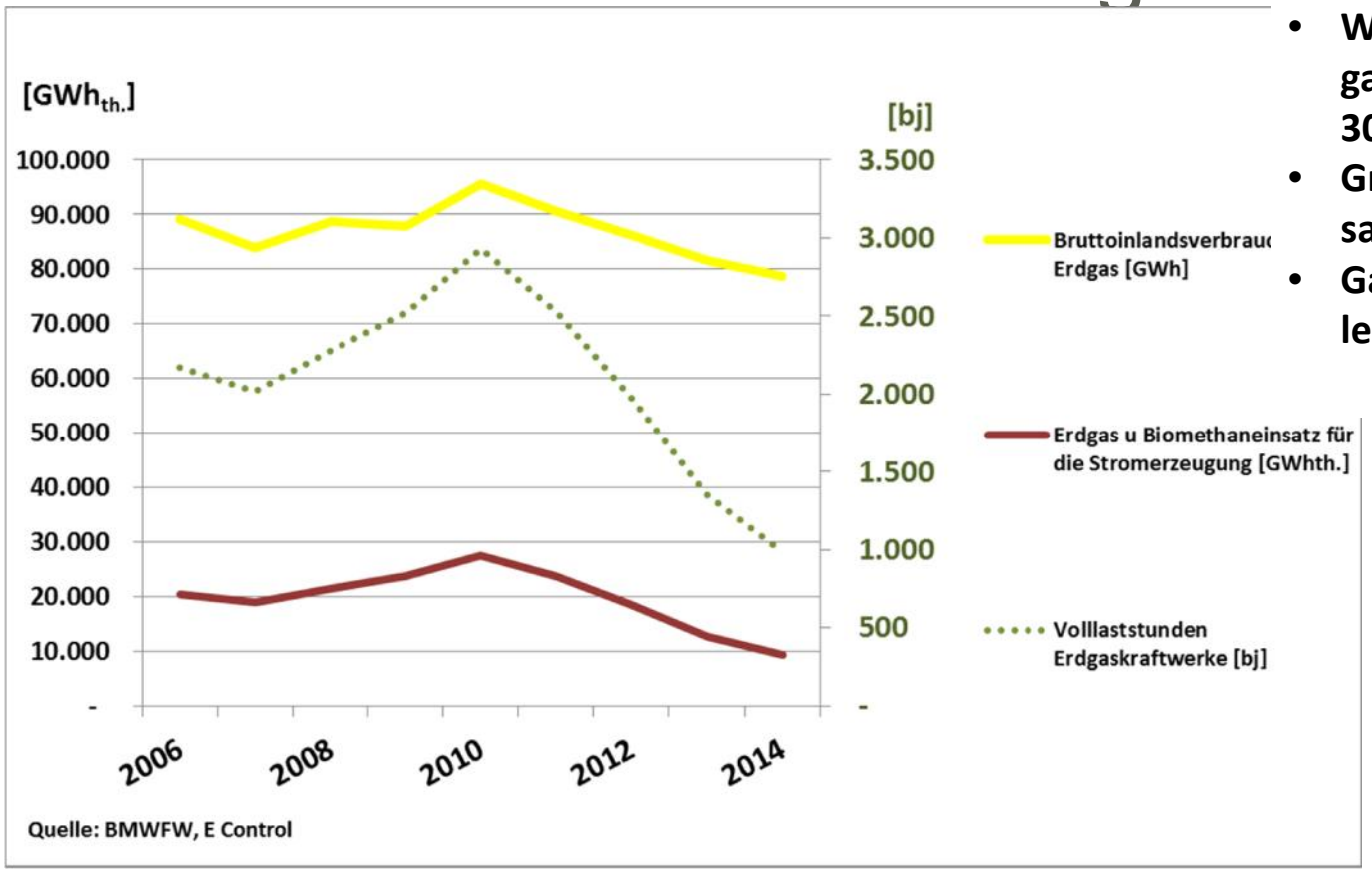
What we know VII: Expected demand of natural gas



- **Without measures natural gas demand will decline ~ 30 to 50 %**
- **Grid costs will raise in the same time**
- **Gas will therefore become less competitive**

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So what do we face

- Urban areas have very low possibilities to lower GHG emissions and have a high consumption of natural gas
- Electricity demand will raise
- Plants with no subsidies are in competition with plants receiving operating aids
- In future nearly no new electricity installations without direct or indirect subsidies
  - After depreciation plants will be shut down and new plants will run for permission and subsidies
  - Higher amounts of Wind and PV causes huge problems with security of supply but politicans does not want to act
- EU wants to create an single energy market
- So far no strict strict rules for security of supply
- GoO of origin do not represent the real value of renewable energies

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What we need if depreciated plants shall stay in operation

- Each trader has to secure energy supply also during dark doldrums
  - balancing energy is not enough to secure supply
- Obligation for end consumer
  - CO2 target
  - Renewable target
- GoO must become an market value

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How Guarantees of Origin could become an market value

- GoO shall be only counted in the member state of consumption and are basis for
  - Energy statistics
  - GHG mitigation
  - GoO must be labelled at each end consumer bill
  - ➔GoO become an fundamental instrument and double counting shall be avoided

- GoO granted from plants with operating aids belongs to the member state and has to be allocated to the payers by the government
- GoO granted from plants with investment subsidies etc. shall belong to the producer and are free tradeable

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Thank you for your attention!

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