

Biogas plants decentralized sources of renewable energy

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Biogas, biodegradable materials, biogas plant

- **Biogas** = mixture of gases produced during decomposition of **biodegradable material** by **microorganisms** in **anaerobic condition (anaerobic digestion)**

Compound	Biogas	Natural gas
<u>Methane</u> (CH ₄)	50 - 75 %	80 - 90 %
Carbon Dioxide (CO ₂)	25 - 50 %	0,5 – 2,5
<u>Nitrogen</u> (N ₂)	1 to 2 %	1 – 5 %
Hydrogen sulphide (H ₂ S)	traces	0 – 5 %

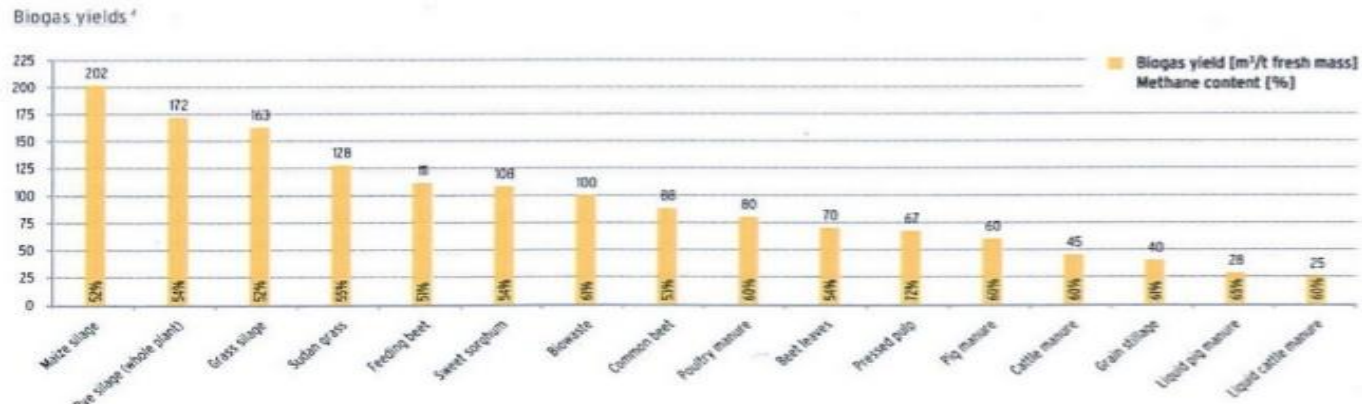
Biogas = energy source = own „natural gas“
Utilization for heat and elektricity production

Biodegradable Substrates (biomass)

plant or animal material, purposely grown energy crops, waste biomass

= regional „products“

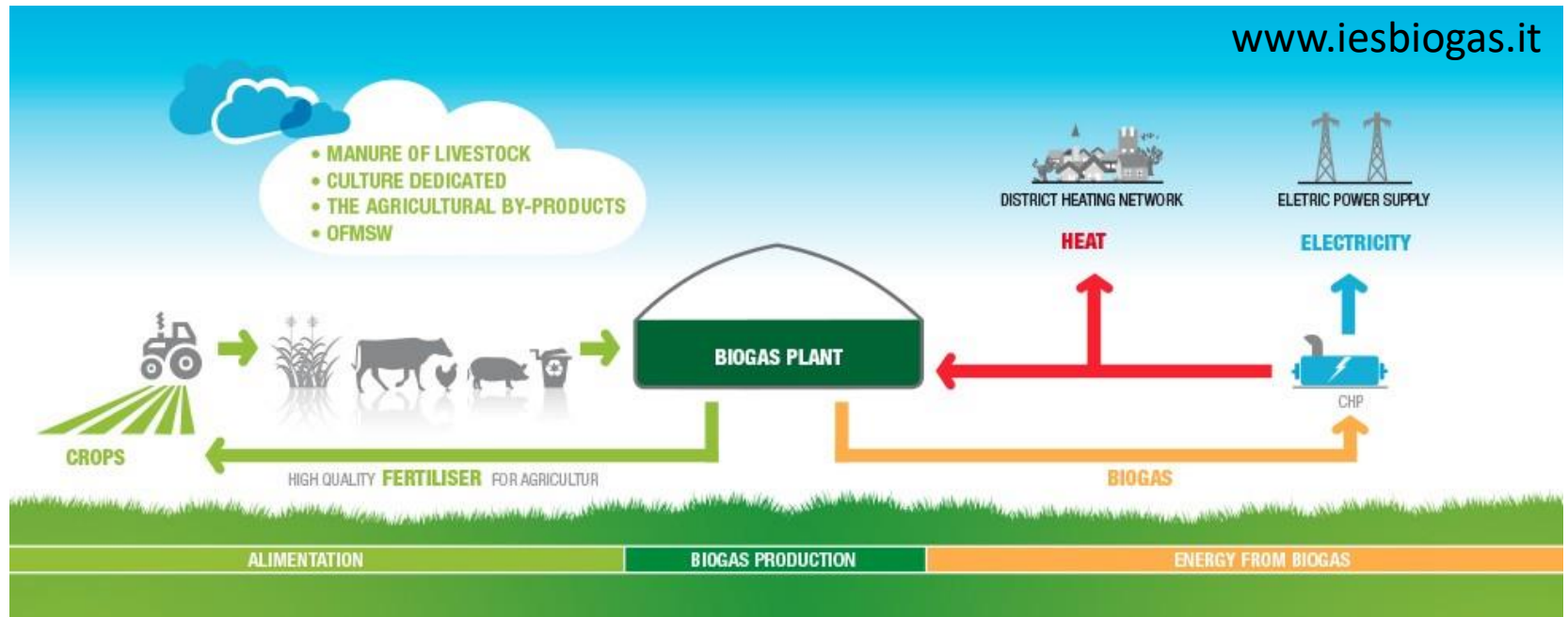
Organic input substrates can vary greatly and result in different gas qualities and quantities. Substrates have an important influence on plant technology selected for anaerobic digestion systems.



Source: AEBIOM Roadmap to Biogas
2010

Biogas plant

www.iesbiogas.it



BGP Třeboň in operation from 2009

Reasons Why:

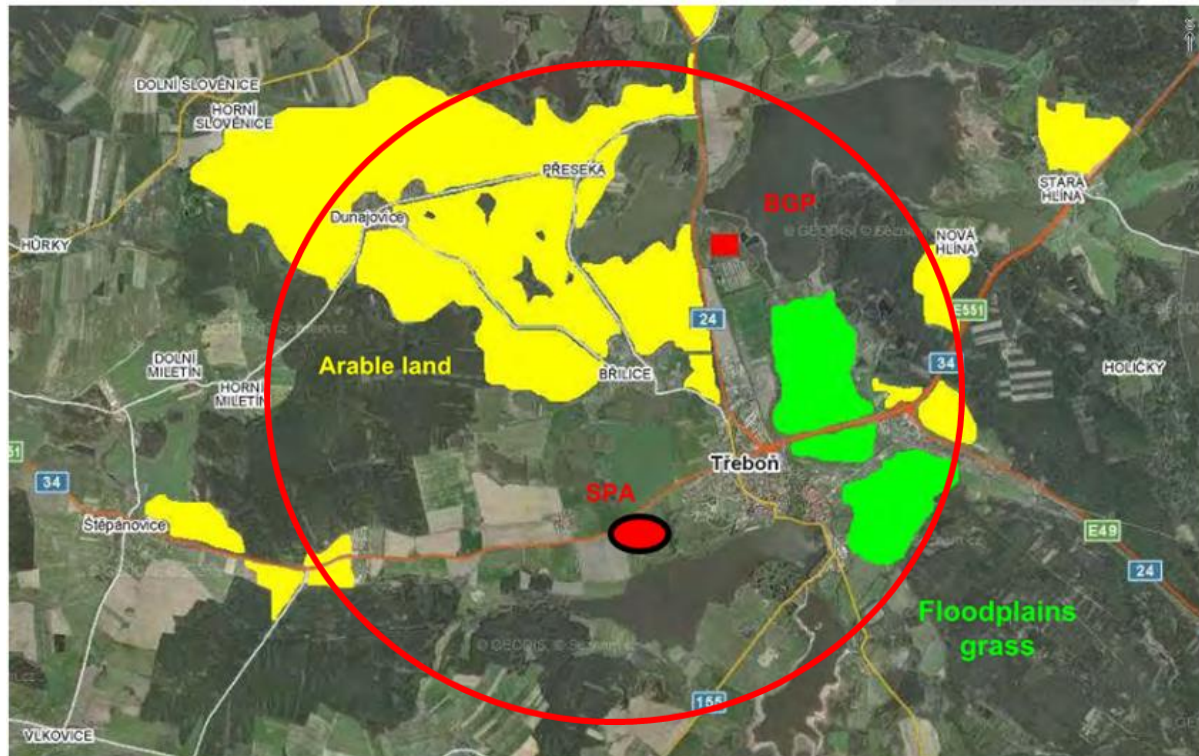
1. production of electricity and **heat**
2. to stabilize agricultural activities in region
3. processing of low feeding quality grass from floodplains



Regional project:

diameter 4 km = area 50 km²

farmers, biomass, staff, production of energy, consumption of heat and „electricity“ = everything is regional



8 km

BGP Třeboň

Installed el. power: 1 000 kW = disponibile cca 7000 MWh/y

Installed heat power: 1 000 kW = **disponibile cca 8000 MWh/y**



**4.3 km of the biogas pipeline to
the heat consumption point
(Municipal Spa)**

BGP Třeboň

- Heat utilization – spa owned by municipality , **apartment blocks**
- The spa uses heat for space heating, heating of swimming pool and thermal baths.
- Win-win project 10 % lower price for heat than from natural gas
- It's saved about 1 million m³ of natural gas annually



Energy consumption in Třeboň

8000 inhabitants



	Heat <i>MWh/year</i>	Electricity <i>MWh/year</i>
Households, spa	24 000	12 000
From Biogas Plant	8 000	7 000
Share	33 %	58 %

Biogas plant can be a excellent decentralized source of energy for human settlements (villages, towns) in rural districts

Radius	Area	20 % of area for biomass	Biomass production (30 t/ha)	Biogas production (170 m ³ /t)	Electricity	Heat	Electricity 1,5 MWh/ p./year	Heat 3 MWh/ p./year
km	ha	ha	FM tons	mil. m ³ /y	MWh/y	MWh/y	people	people
1	314	63	1890	0,3	643	643	426	107
3	2 826	565	16 956	2,9	5 044	5 044	3 400	1 681
4	5 024	1005	30 144	5,1	8 968	8 968	6 000	3 000

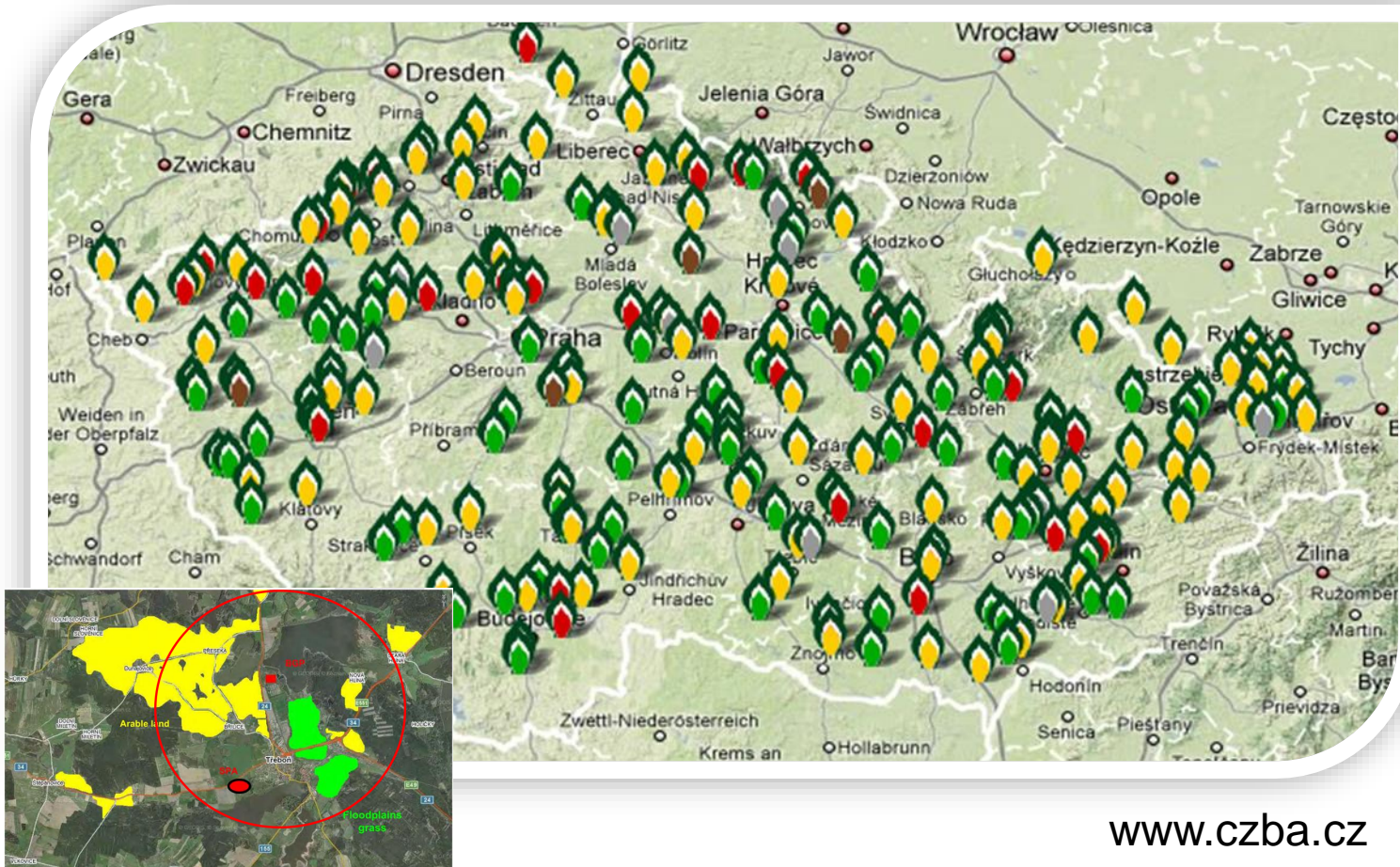
Average annual consumption in CZ

Electricity	1,5 MWh/person/y
Heat	3,0 MWh/person/y

Biogas plants in the Czech Republic

total area 78 866 km²

576 BGP, 360 MW inst. el.



**Thank you
for your attention**

and greetings from Třeboň !

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