



SWITCH TO A RENEWABLE FUTURE

biogas plants

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biogas plants

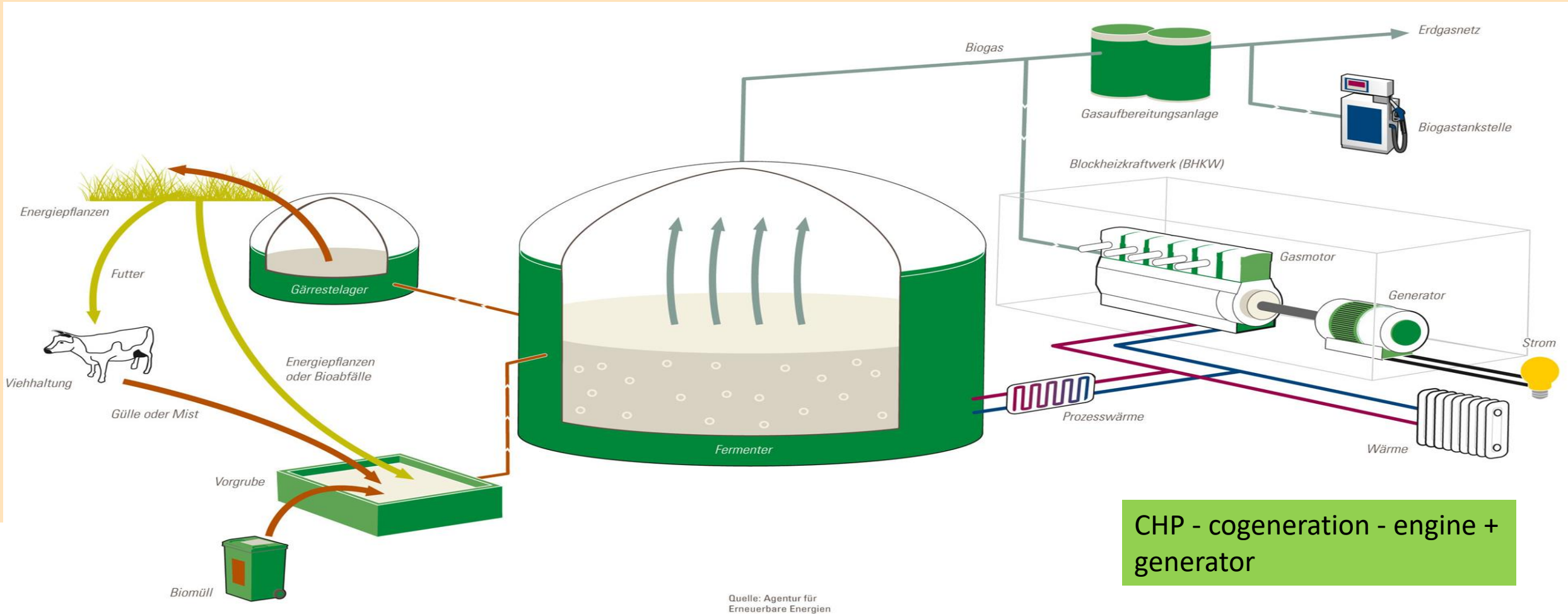
- Bioenergy Lautertal in Sulzbach supplies the local town center and districts with heat



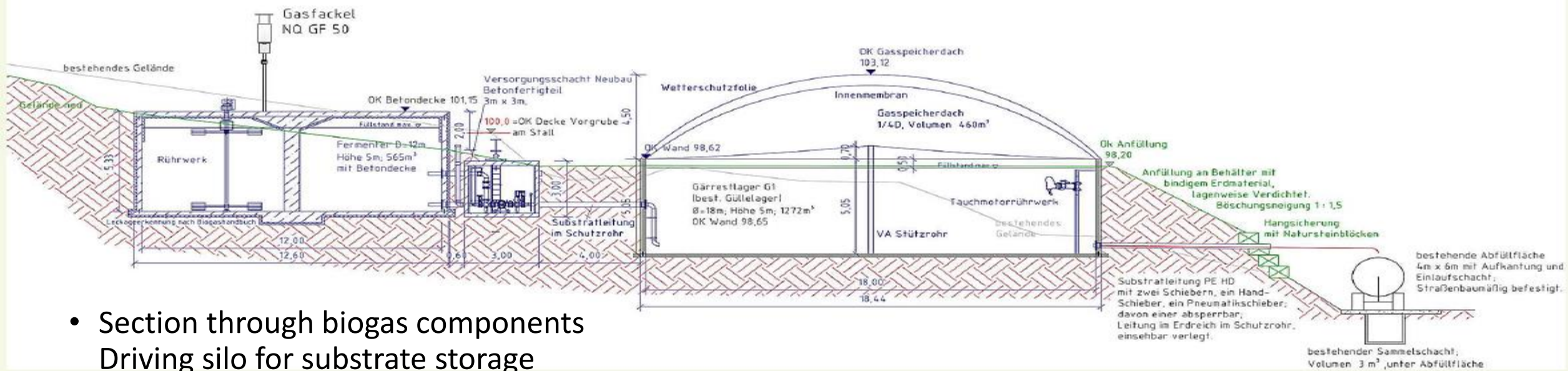
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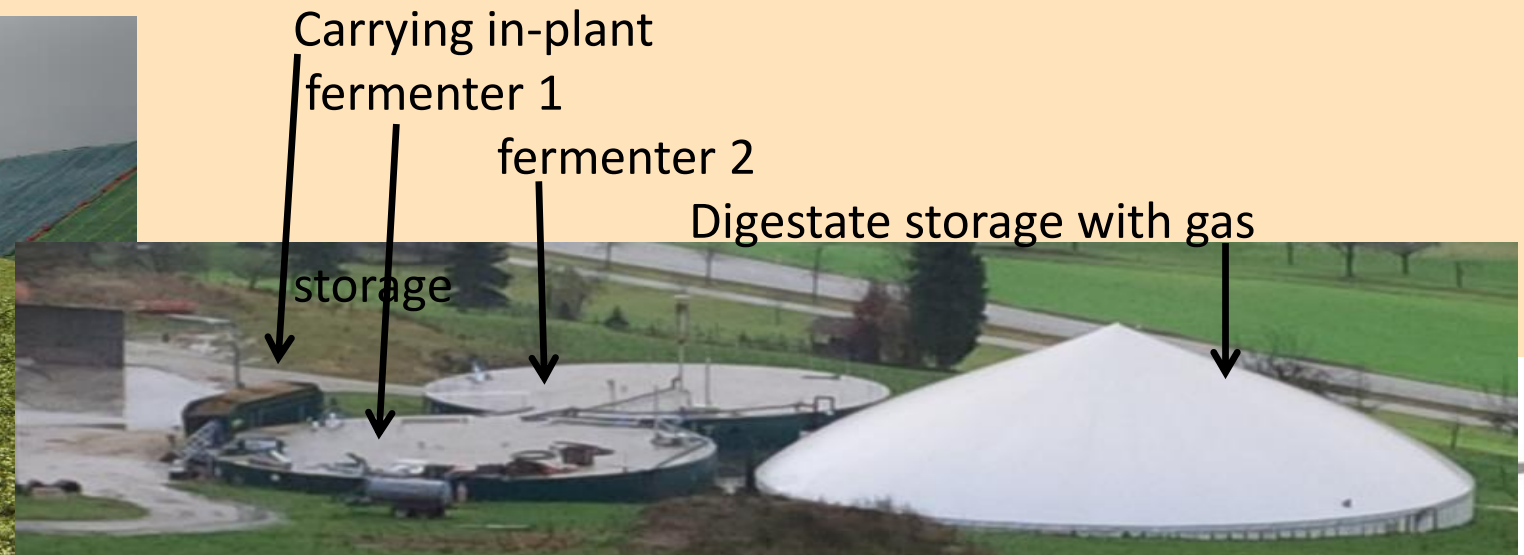
Biogas technology



Biogas technology 2



- Section through biogas components
Driving silo for substrate storage



Biogas refund

- Payment for the electricity, generated by biogas plants and feed it into the grid:
- Nawaro:
Abbreviation for renewable resources?
 - The remuneration for plants with 550 kW is 0.21 euro per kilowatt-hour for electricity that is fed into the power grid.

			2009 (EEG 2009)		
			bis 150 kW	bis 500 kW	bis 5 MW
Grundvergütung			11,67	9,18	8,25
Luftreinhaltungs-Bonus			1		/
KWK-Bonus	EEG 2004		2	2	2
	EEG 2009		3	3	3
NawaRo-Bonus			7	7	4
Gülle-Bonus			4	1	/
Landschaftspflege-Bonus			2		/
Technologie-Bonus	Gasaufbereitung ³	350 Nm ³	2	2	2
		700 Nm ³	1	1	1
		>700 Nm ³	/	/	/
	Innovative Anlagentechnik		2	2	2



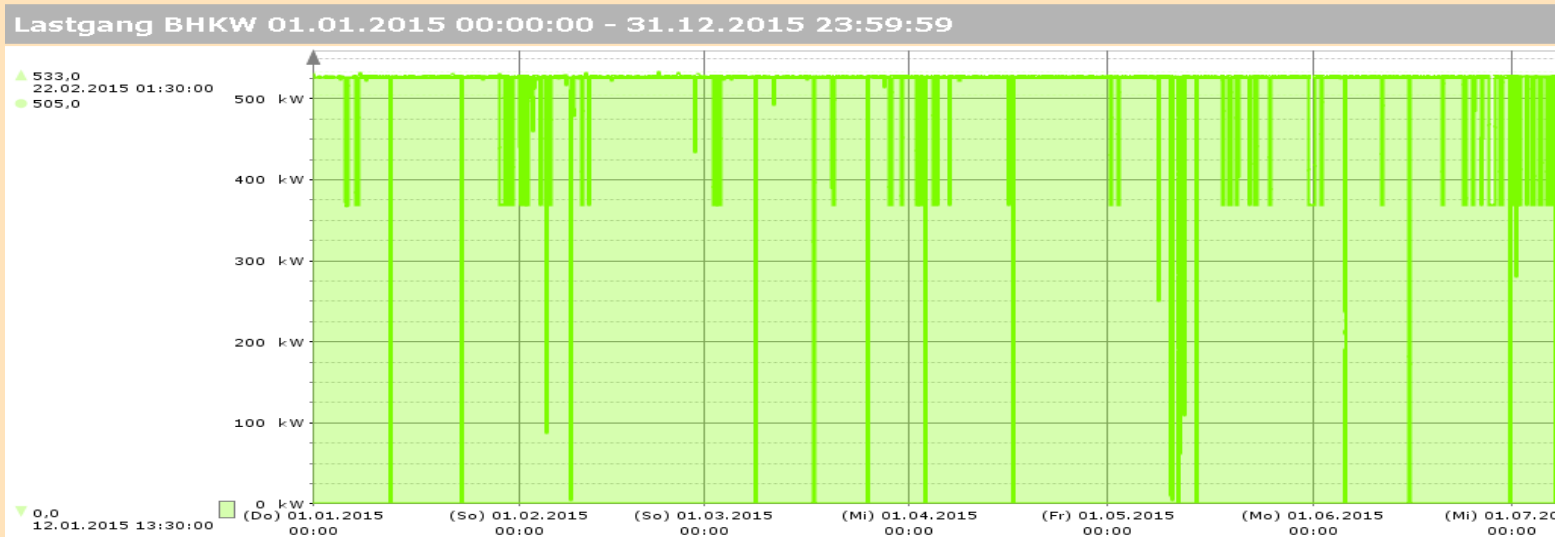
biogas substrates

- Corn is the most important renewable raw material in the production of biogas.
 - high yields per hectare
 - efficient harvest with crop choppers
 - good storability as corn silage
 - good to import into the biogas plant
 - degradable by a high starch content
 - does not contain long fibers that could interfere with the system technology
 - is used throughout the year as corn silage
- Chicken manure or turkey manure contains intestinal bacteria of animals and acts on the bacteria in the fermenter as a catalyst and is often used
- Manure loses its smell and fermentation can then be spread directly to the fields

Vergleich von Biogasrohstoffen

Material ◆	Biogasertrag^[1] in m³ pro Tonne Frischmasse ◆	Methangehalt ◆
Maissilage	202	52 %
Grassilage	172	54 %
Roggen-GPS	163	52 %
Futterrübe	111	51 %
Bioabfall	100	61 %
Hühnermist	80	60 %
Zuckerrübenschnitzel	67	72 %
Schweinemist	60	60 %
Rindermist	45	60 %
Getreideschlempe	40	61 %
Schweinegülle	28	65 %
Rindergülle	25	60 %

production diagram „Lautertal“ 2015

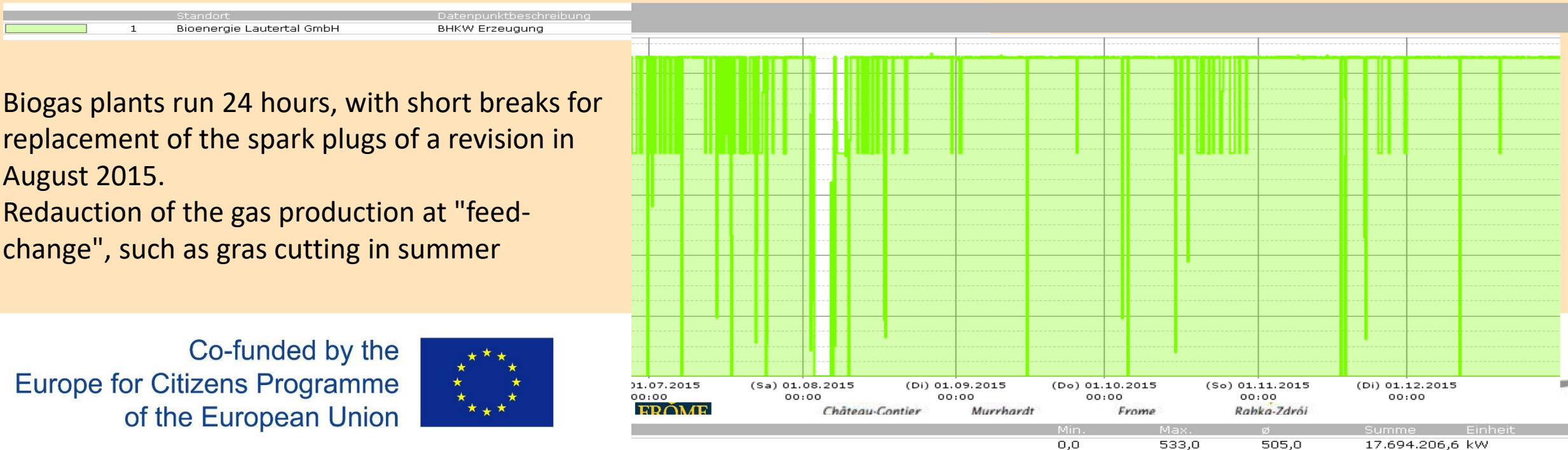


Key figures of biogas CHPs Lautertal:

- 526 kW electrical
- 548 kW thermal
- Total production 2015: 4,420,000 kWh
- Use Time 2015: 8400 h

Biogas plants run 24 hours, with short breaks for replacement of the spark plugs of a revision in August 2015.

Redauction of the gas production at "feed-change", such as gras cutting in summer

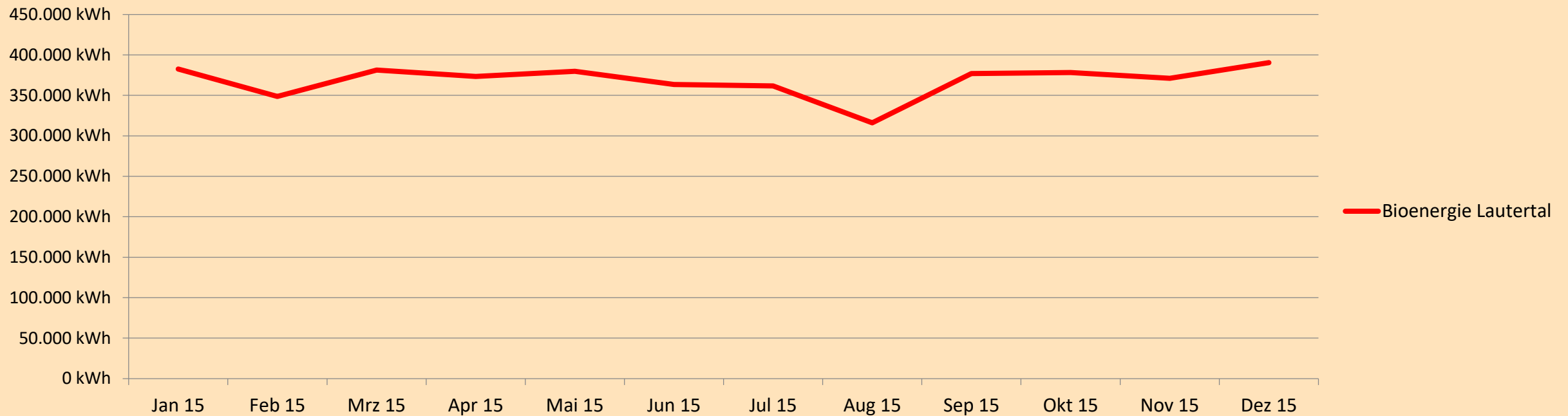


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Production diagram monthly data

Bioenergie Lautertal



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Pros and Cons of biogas plants

Pros

- Energy locally
- Use of "waste"
- "Main pillar" for farmer as energy producer
- controllable power generation
- Endurance runner with up to 8,600 hours of full load production during the year (8760 h / a)
- Cycle of materials from field to fermentation and as fertilizer on the field

Cons

- high electricity refund results in high EEG surcharge for final consumers
- Pollution of the environment in the harvest season

