

Biogas for Canada: Learning Lessons from Germany ?

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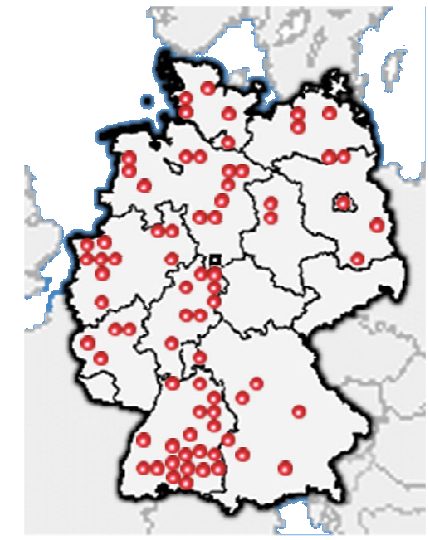
Growing the Margins, London, Ontario, April 04, 2008

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Engineering Office, Planning and Construction of Biogas Plants

Founded: 1999
Team: 18
Experience: > 20 years
References: ca. 120 biogas plants
in: Germany, Japan, Netherlands, Austria, Switzerland, Lithuania, Italy, Slovakia, Canada, USA, Spain, France
Partners: Japan, Korea, USA, Canada, Bulgaria, France, Hungary, Turkey, Poland, Spain, Ireland



BGA Porta, Spain

Built: 2006

Digester: 1,360 m³, concrete tank

CHP: 191 kWe gas engine

Input: pig manure, organic waste





BGA Cudworth Pork, Saskatoon, Canada

Built: 2003

Digester: 2,000 m³, steel tank

CHP: 4 x 30 kWe Microgasturbines

Input: potato, manure

BGA Bekkai, Japan

Built: 2002

Digester: 1,500 m³, steel tank

CHP: 3 x 167 kWe gas engines

Input: manure, waste



BGA Kogel, Germany

Built: 2004

Digester: 2 x 2,600 m³, concrete tanks

CHP: 1 MWe gas engine

Input: kitchen waste



BGA Dobler, Germany

Built: 2005

Digester: 500 m³, concrete tank

CHP: 2 x 90 kWe gas engines

Input: corn silage, grass silage



BGA Fabel, Germany

Built: 2001

Digester: 1,200 m³, concrete tank

CHP: 110 kWe dual fuel engine

Input: pig manure, waste potatoes, sugar beet residues, agricultural waste in general



BGA Prato allo Stelvio, Italy

Built: 2001

Digester: 2 x 800 m³, concrete tanks

CHP: -

Input: cattle manure, apple waste



Prad

manure, apple
juice residues

BGA im Brahm, Germany

Built: 2006

Digester: 1,200 m³, concrete tank

CHP: 2 x 191 kW_e gas engine

Input: pig manure, horse dung, kitchen waste



Im Brahm

pig manure,
kitchen waste

BGA Stange, Germany

Built: 2000

Digester: 600 m³, concrete tank

CHP: 45 kWe dual fuel engine

Input: chicken manure, pig manure, other organic waste





BGA Nij Bosma Zathe, Netherlands

Built: 2000

Digester: 80 m³, steel tank

CHP: 37 kWe dual fuel engine

Substrate: cattle manure, grass

BGA Wietzendorf, Germany

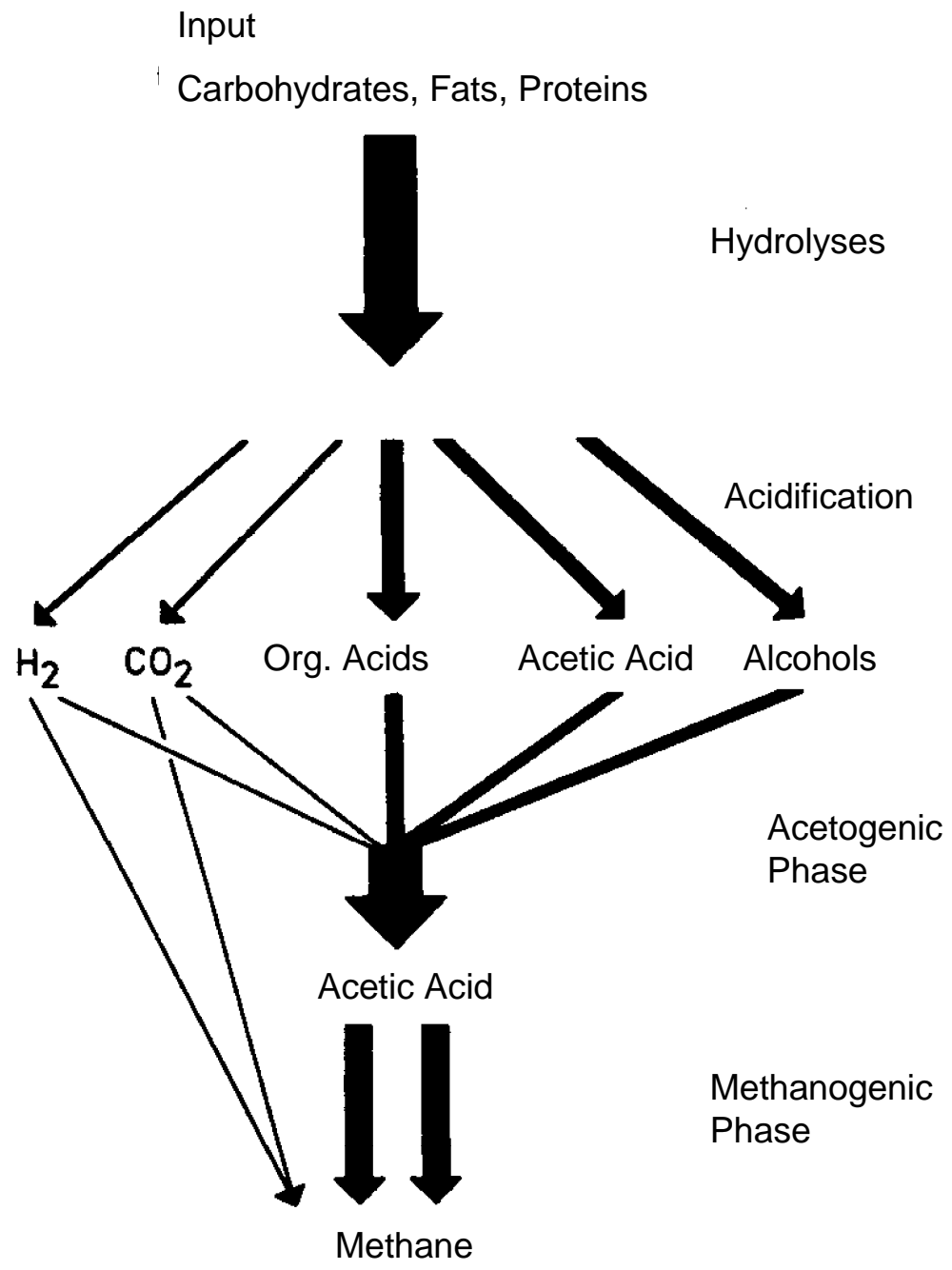
Built: 2000-2002

Digester: 4 x 2,500 m³, steel tanks

CHP: 4 x 2.1 MWe gas engines

Substrate: potato waste





Scheme of anaerobic Digestion Process

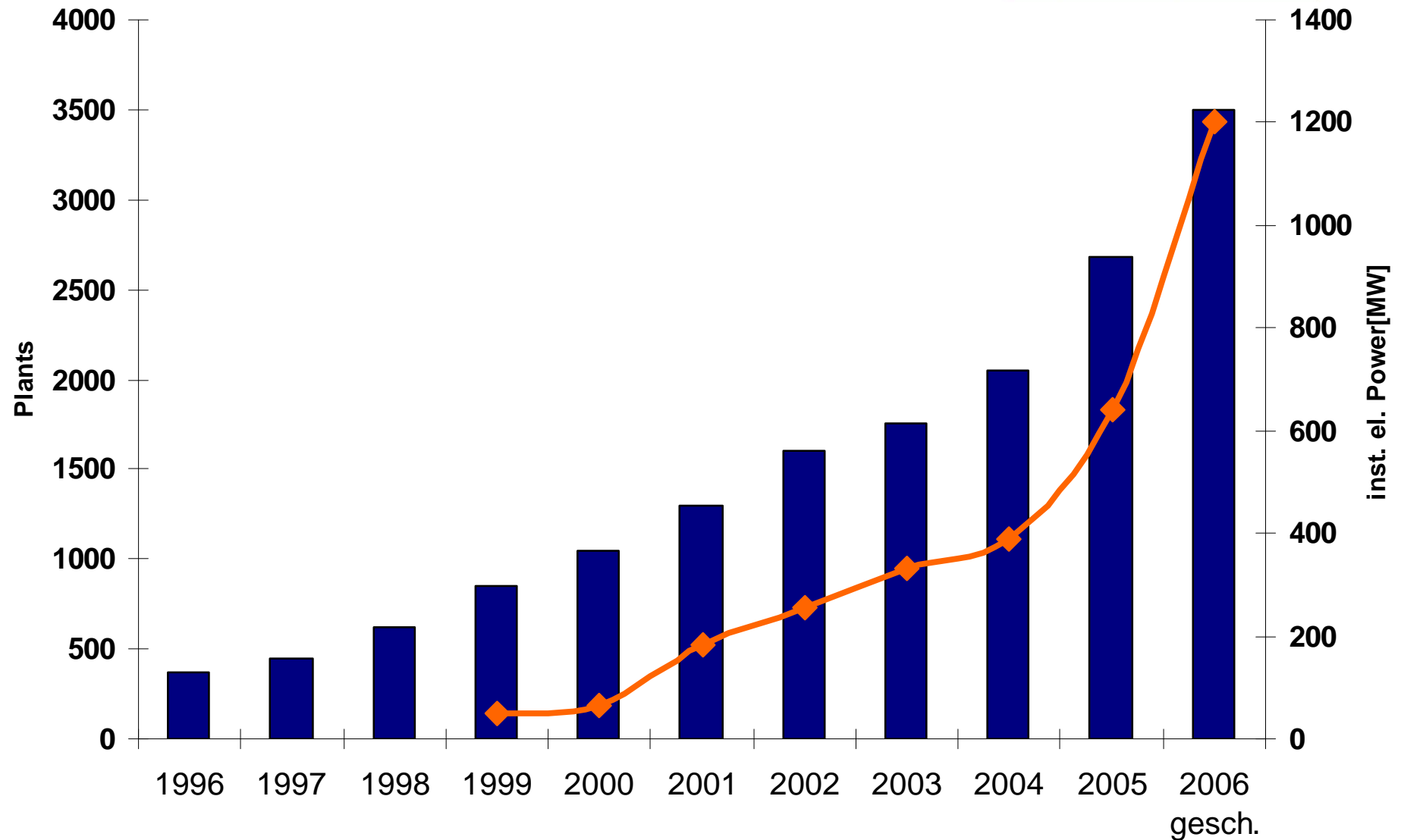


Why did I show you all these different Biogas Plants?

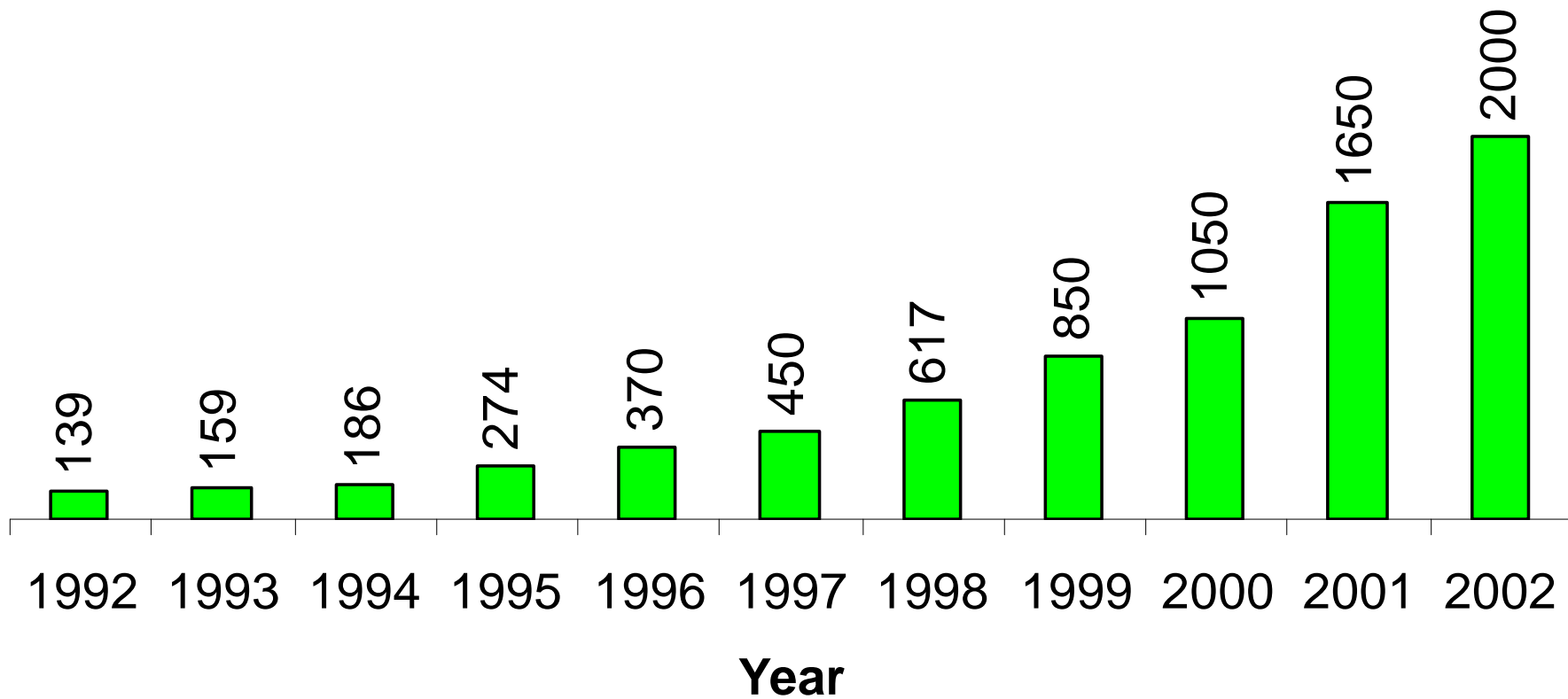
1. to confuse you !
2. to show you what „Engineering“ can mean



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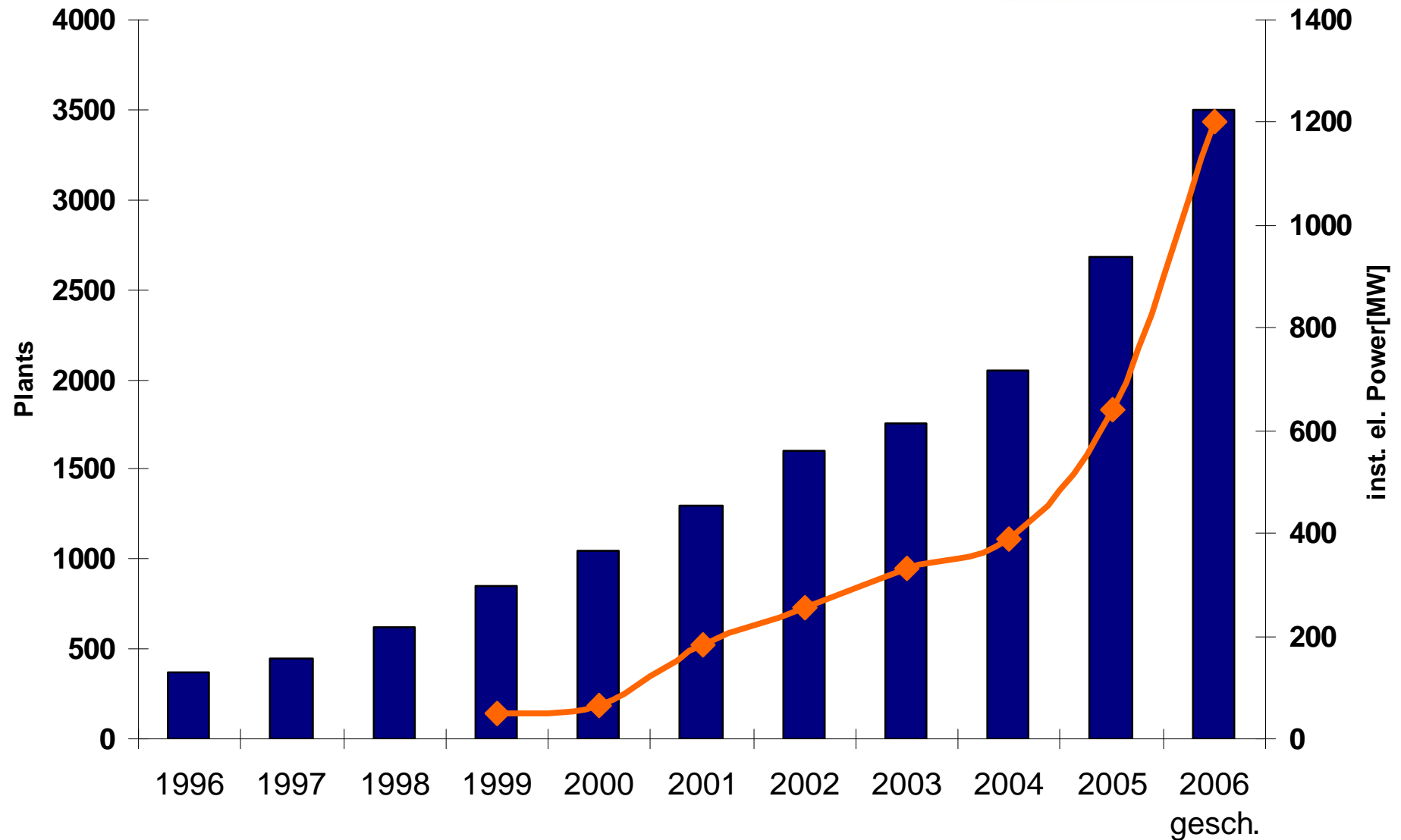


Biogas Plants in Germany





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History in Germany

1. Input Substrates 1985 – 2000: Manure + all Kinds of organic Waste
2. Input Substrates 2000 - 2008: Corn Silage + Corn Silage + Corn Silage + Corn Silage

Situation in Germany today

1. 10,000 people working in biogas business
2. More than 8,000 have been hired in the past three years
3. More than 8,000 people's experience is limited to corn silage digestion
4. Optimisation in Germany: 500 kWe Biogas Plants with Corn Silage = Cookie-cutter Design

Situation in Canada today

1. „10“ people working in biogas business
2. Ontario: 50% payment for electricity from biogas – compared to Germany
3. Ontario: corn silage digestion is economically not feasible
4. You **MUST** have organic waste for an economically feasible biogas plant and you **MUST** have income through tipping fees

Cookie-cutter Design ?

1. good for standardised input substrates
2. in Germany since 2004
3. no sense for waste based biogas plants !

No Cookie-cutter Design !

1. in Canada because: different input substrates compared to Germany
2. in Canada because: different input substrates from plant to plant
3. in Canada because: what has to be pasteurised ?
4. in Canada because: absolutely different sizes of biogas plants
5. in Canada because: cloudy regulations

Biogas for Canada: Copying Germany ?

1. YES, because
2. NO, because ...

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