Global Methane Initiative
Agriculture, Municipal Solid Waste, Wastewater
Subcommittee Meetings
Singapore 2 – 3 July 2012

LANDFILL GAS TO ENERGY PROJECTS IN POLAND UPDATE

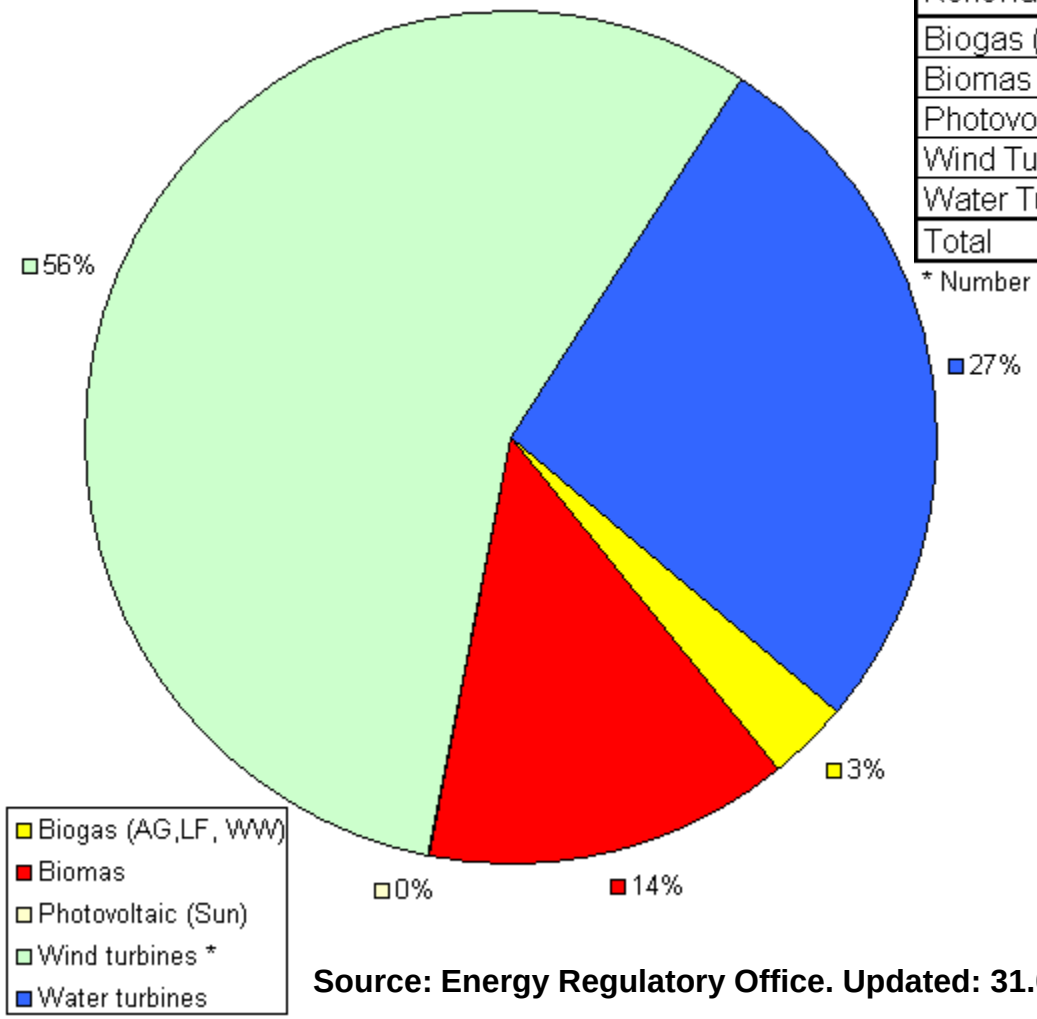
Piotr Klimek

Instytut Nafty i Gazu (Oil & Gas Institute)

Renewable Energy in Poland

Renewable Energy Source	Capacity [MW]	Number of Projects
Biogas (AG,LF, WW)	111,82	178
Biomas	485,41	21
Photovoltaic (Sun)	1,13	6
Wind Turbines *	1968,30	590
Water Turbines	951,46	750
Total	3518,12	1545

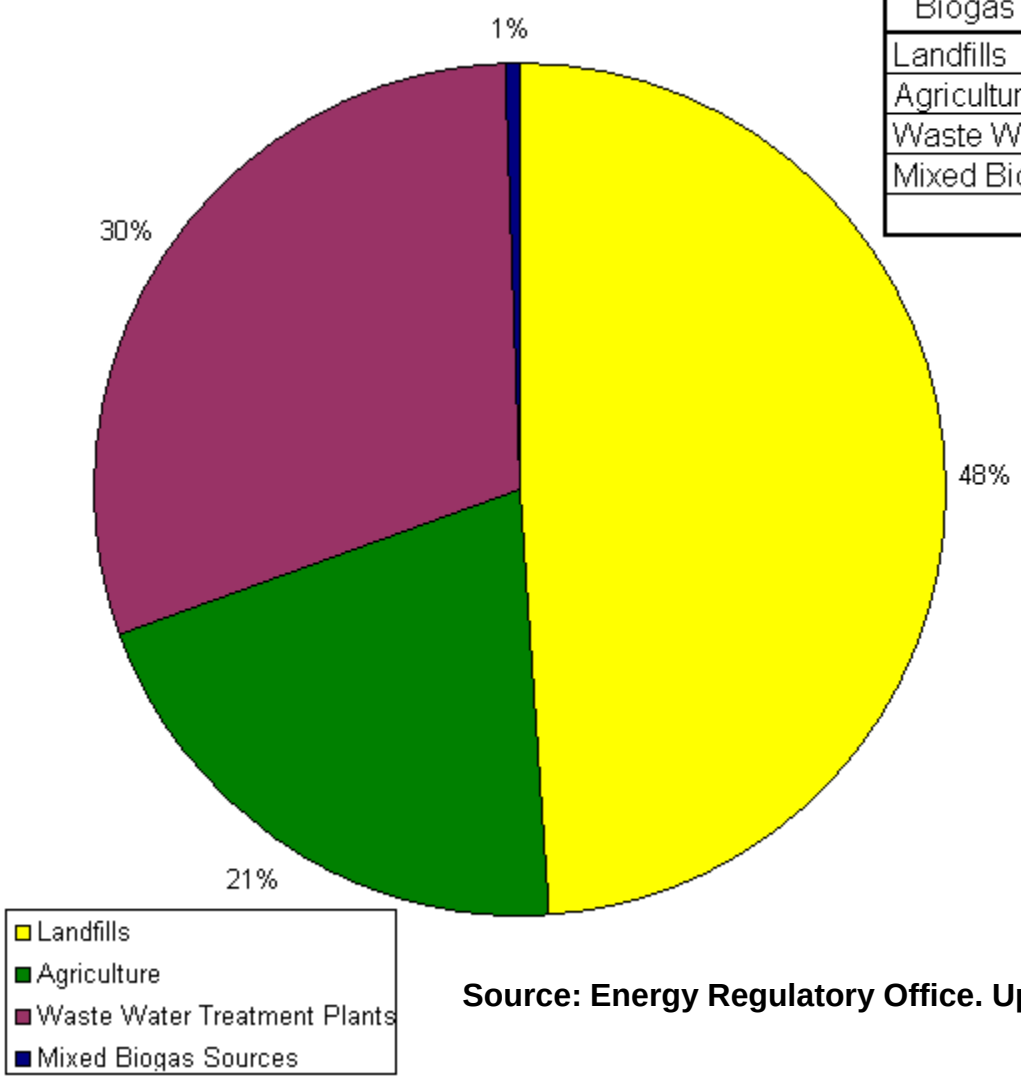
* Number of Projects = Number of Turbines



Source: Energy Regulatory Office. Updated: 31.03.2012

Renewable **Biogas** Energy in Poland

Biogas Source/Project Type	Capacity [MW]	Number of Projects
Landfills	54,59	89
Agriculture	23,07	21
Waste Water Treatment Plants	33,55	67
Mixed Biogas Sources	0,60	1
Total	111,81	178



Source: Energy Regulatory Office. Updated: 31.03.2012

Landfills in Poland

Landfills conditions:

- Landfills in Poland are well managed.
- According to Polish Law Acts and EU Directives every landfill is required to have leachate and LFG collection systems. Ground water contamination monitoring and landfill gas emissions monitoring are also required.

Landfill sizes:

- Landfills in Poland are mostly small (area lower than 3 ha) and medium size (area lower than 15 ha). Larger landfills exist only in major urban areas (main cities or capitals of voivodeships).

LFG to Energy Projects in Poland

- Electricity generation from LFG is dominant technology in Poland (more than 90% of LFGE projects)
- There are only a few CHP installations (heat is sold out to end users)
- The most commonly used LFG electricity generation technology is internal combustion engines
- Most installations are located at large municipal landfills

LFG to Electricity Projects in Poland

Number of projects and its capacity

Voivodeship	Number of projects	Capacity [MW]
dolnośląskie	5	4,345
kujawsko-pomorskie	8	3,814
lubelskie	1	0,5
lubuskie	1	0,5
łódzkie	4	4,206
małopolskie	6	2,928
mazowieckie	21	11,956
opolskie	1	0,45
podkarpackie	3	1,029
podlaskie	1	0,7
pomorskie	4	3,557
śląskie	14	11,188
świętokrzyskie	1	0,36
warmińsko-mazurskie	2	1,142
wielkopolskie	7	5,09
zachodniopomorskie	10	2,825
Total	**89**	**54,59**

Source: Energy Regulatory Office. Updated: 31.03.2012

History of LFG to Electricity Projects in Poland

LFG Electricity Projects in 2002 – 2012

LFG Projects Capacity:
Year 2002* – 15 MW
Year 2003* – 15 MW
Year 2004* – 17 MW
……
March 2011# – 48 MW
March 2012# – 54 MW

* source: Obwieszczenie Ministra Gospodarki w sprawie ogłoszenia raportu zawierającego analizę realizacji celów ilościowych i osiągniętych wyników w zakresie wytwarzania energii elektrycznej w odnawialnych źródłach energii (M.P.06.31.343)

source: http://www.ure.gov.pl/uremapoze/mapa.html

LFG to Electricity Projects in Poland

Revenue sources

- Conventional electricity market price is established by The Energy Regulatory Office – 203,4 PLN/MWh ($64/MWh)
- „Green certificates” – 255 PLN/MWh ($80/MWh) (additional amount to conventional electricity price)