

IEA Bioenergy - Task 37
“Energy from Biogas and Landfill Gas”

Country Report Norway

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Framework and tools for stimulating the development of biogas in Norway

The Norwegian Government aims that 30% of livestock manure in combination with 600 000 tons of food waste to be treated in biogas plants within 2020

In Report to Parliament. No. 39 (2008 -2009), Climate change - part of agriculture solution), it is stated that biogas is the single measure that holds the greatest potential to reduce emissions of greenhouse gases in the agricultural sector

Framework and tools for stimulating the development of biogas in Norway



- **Within agriculture** there are few governmental incentives to develop facilities for biogas production.
- **In the waste management industry**, biogas production based from sewage sludge and food waste take place to some extent.
 - This is partly because of the ban on landfilling of biodegradable waste (effective July 1, 2009)

Sørheim et al. 2010. Biogass - Kunnskapsstatus og forskningsbehov, Bioforsk Report Vol. 5 Nr. 16.

Framework and tools for stimulating the development of biogas in Norway

Innovation Norway (Bioenergy Program)



- Target: farmers / forest owners
 - Budget:
 - 35 million NOK agricultural agreement
 - 15 million NOK from state budget
- Supports activity within:
 - Construction of heat sales
 - Farm Heating
 - Greenhouse
 - Biogas
 - Preliminary studies / pilot projects

Innovation Norway promotes nationwide industrial development profitable to both the business economy and Norway's national economy, and helps release the potential of different districts and regions by contributing towards innovation, internationalization and promotion.

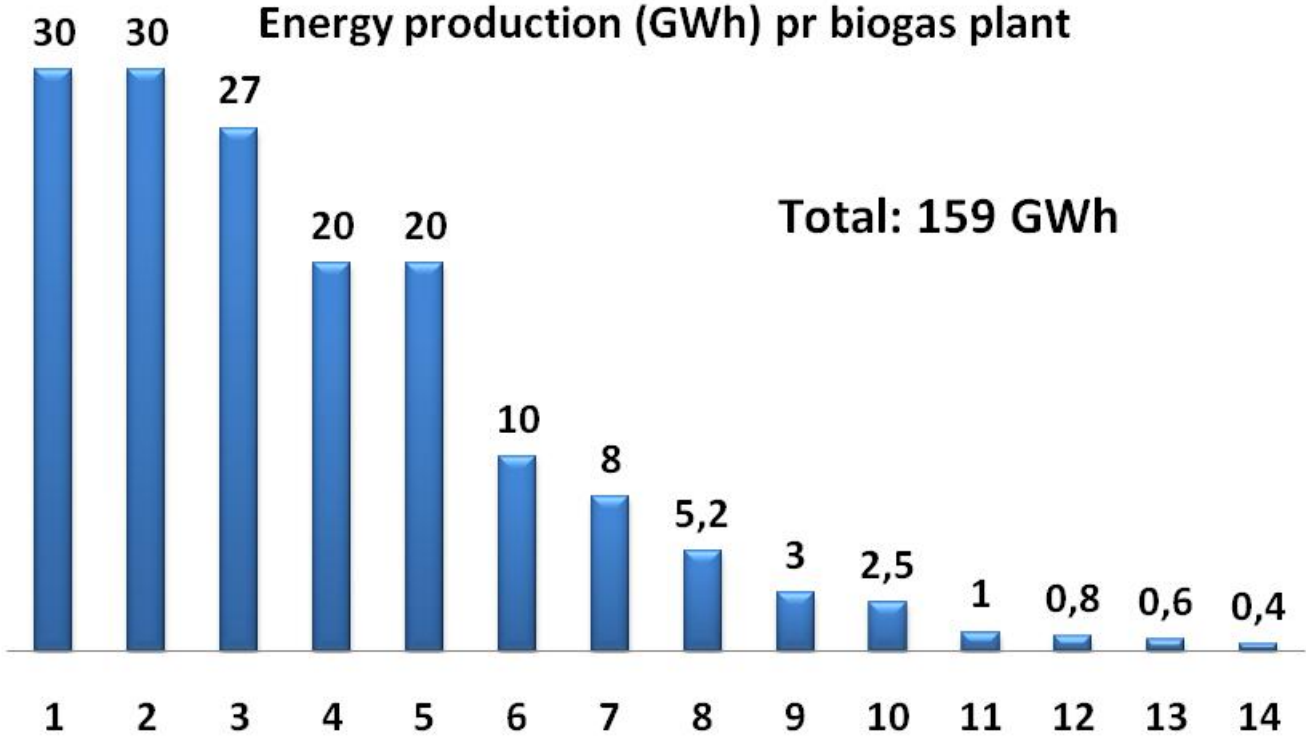
Framework and tools for stimulating the development of biogas in Norway



- ENOVA (Enova's application for biogas (2009-2011))
 - Support: only to manufacturer
 - Industrial scale, at least 1 million kWh per year
 - Investment - up 30% of the investment amount and 8% monetary return
 - Top priority projects (competition)

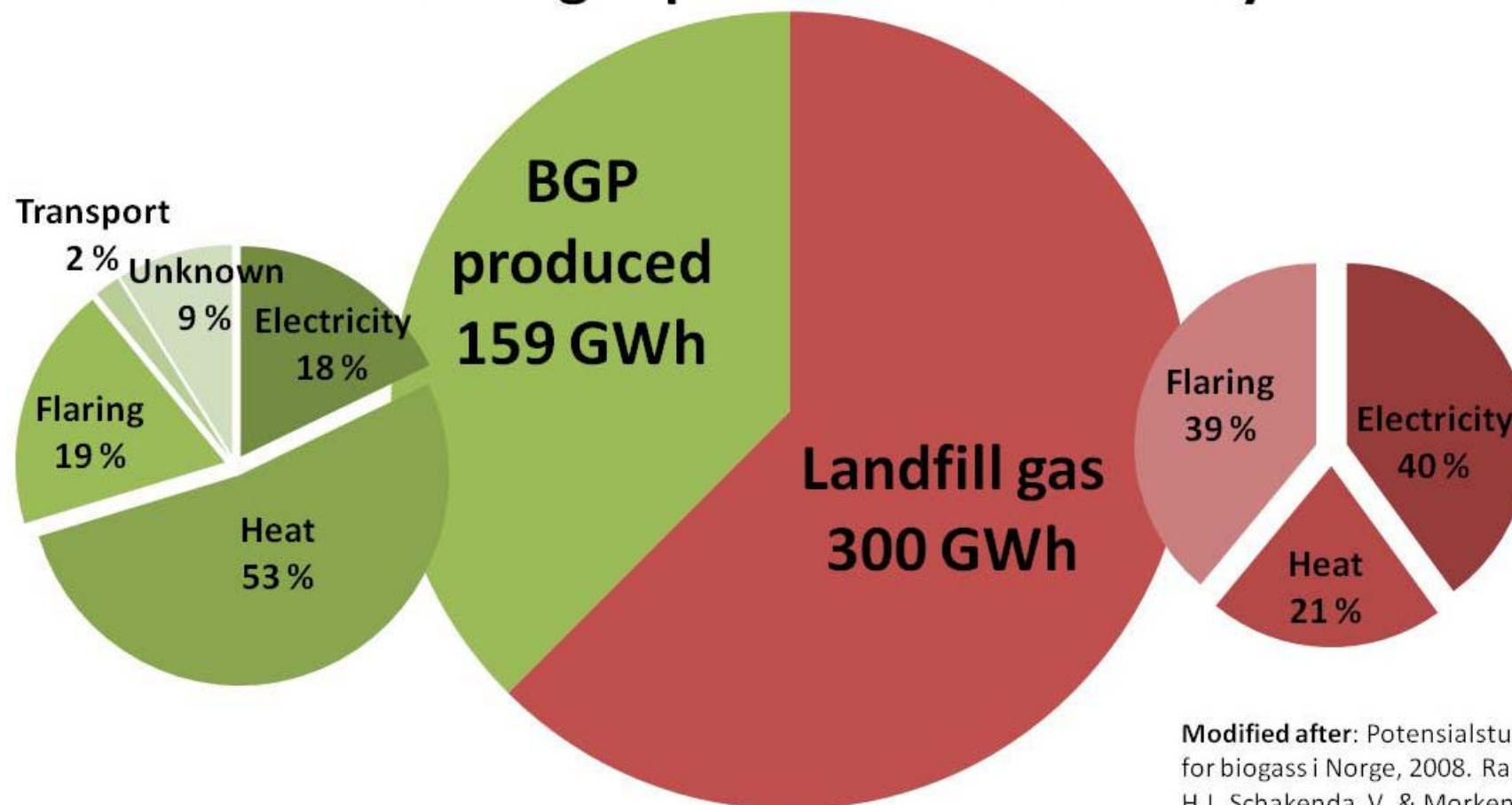
ENOVA is owned by the Ministry of Petroleum and Energy. It was established to take a leading role in promoting environmentally friendly restructuring of energy consumption and energy generation in Norway. Enova's goal is to make it easier for public and private enterprises to choose simple, energy-efficient and environmentally correct solutions.

Biogas production at BGP in Norway 2010



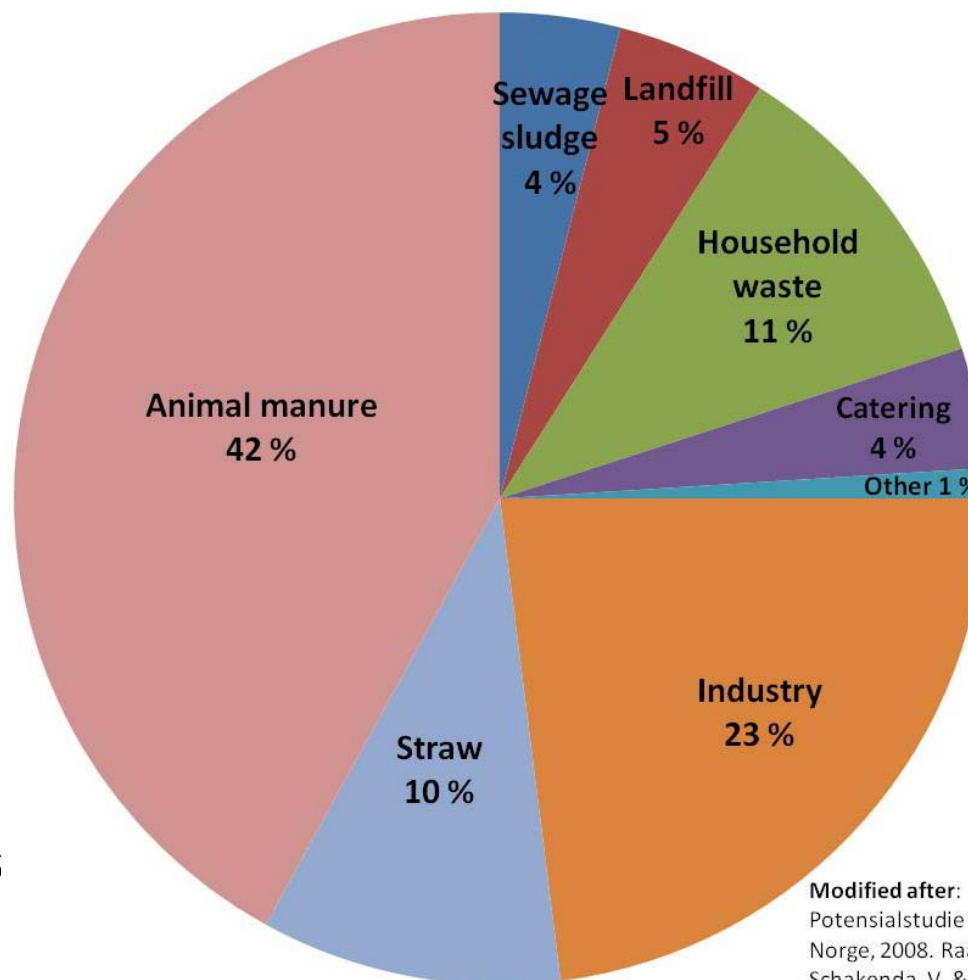
Biogas utilization

Total biogas production in Norway



Modified after: Potensialstudie for biogass i Norge, 2008. Raadal, H.L, Schakenda, V. & Morken, J. Report, 55 p. ISSN: 0803-6659

Distribution of theoretical energy potential of different resources in Norway

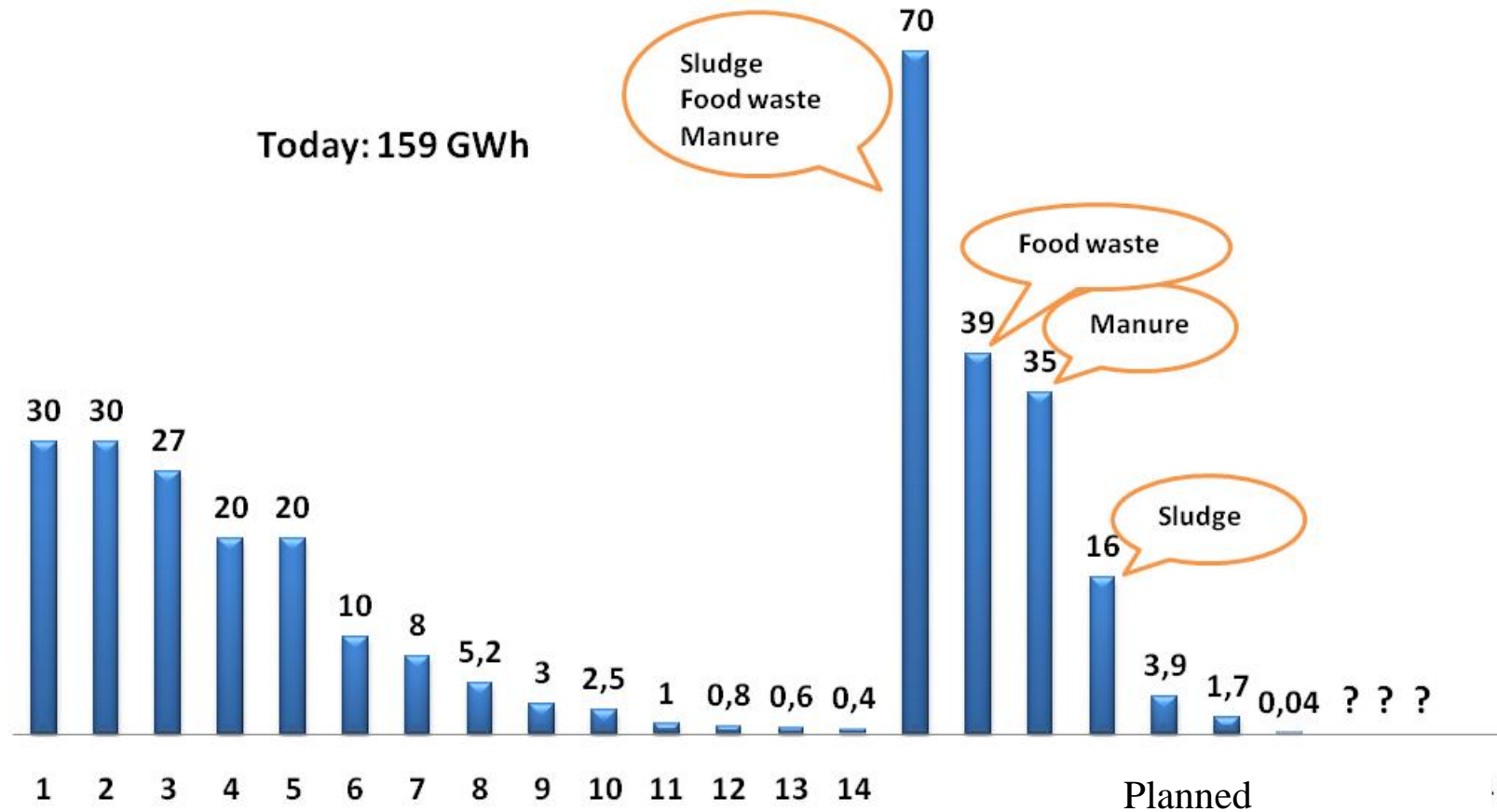


Potential energy production from waste and by-products is estimated to be 6 TWh

Modified after:
Potensialstudie for biogass i Norge, 2008. Raadal, H.L, Schakenda, V. & Morken, J. Report, 55 p. ISSN: 0803-6659

Future - Utilization of resources for biogas

Biogas production (GWh) at BGP in Norway today and in the future



Biogas utilization - the future

- Large biogas plants are planning to upgrade the biogas to fuel
- Small biogas plants utilize the biogas on farms
- Digestate
 - a valuable fertilizer in agricultural and horticultural production

Research (2010-2014)

National Research Council funded Biogas projects

Program at NRC:

- **Natur og Næring (Nature-based Industry):** 6 projects
 - Total value: 33,9 mill NOK (4,1 mill €)
- **Renenergi (Clean Energy for the Future):** 5 projects
 - Total value: 37,1 mill NOK (4,5 mill €)
- **Matprogrammet (The Food Programme):** 2 projects (digestate utilization)
 - Total value: unknown