

NextGenBioWaste



EUs largest project within energy from waste and biomass
Homepage: www.NextGenBioWaste.com

Picture courtesy of
ASM, Brescia, Italy

NextGenBioWaste's vision

Greener energy supply in Europe

NextGenBioWaste will help the European Union to achieve their target of a greener energy supply by contributing to

- reduction in CO₂ emissions
- security of energy supply
- increasing the share of renewable energy sources from 6 to 12%
- increasing the share of green electricity from 14 to 21% of gross electricity consumption by 2010
- enhancing the competitiveness of European industry (Capitalising from European research)
- new standards




• **Title: "Innovative demonstrations for the next generation of biomass and waste combustion plants for energy recovery and renewable electricity production"**

- Co-funded by the European Commission (6FP)
- Contract no.: 019809
- Project duration: 2006-2010 (48 months)
- Budget: 29 017 555 €
- Co-ordinator: SINTEF Energiforskning AS, Norway



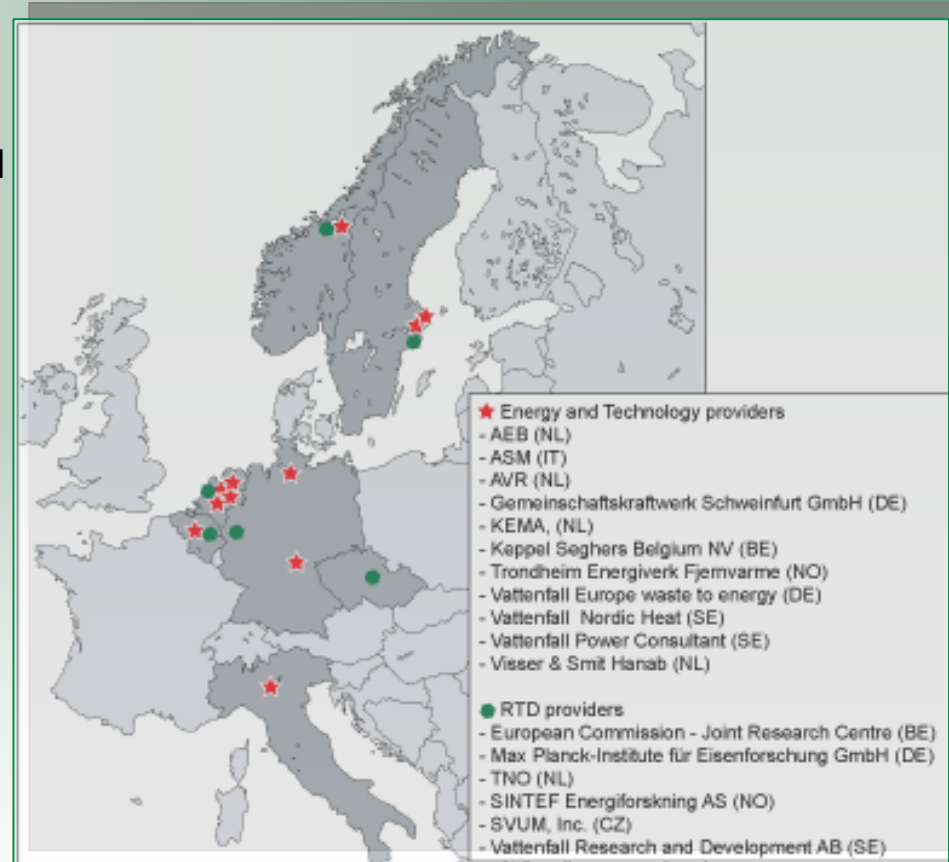
Consortium - 17 partners from 7 countries

Co-ordinator:

 SINTEF Energiforskning AS

Partners:

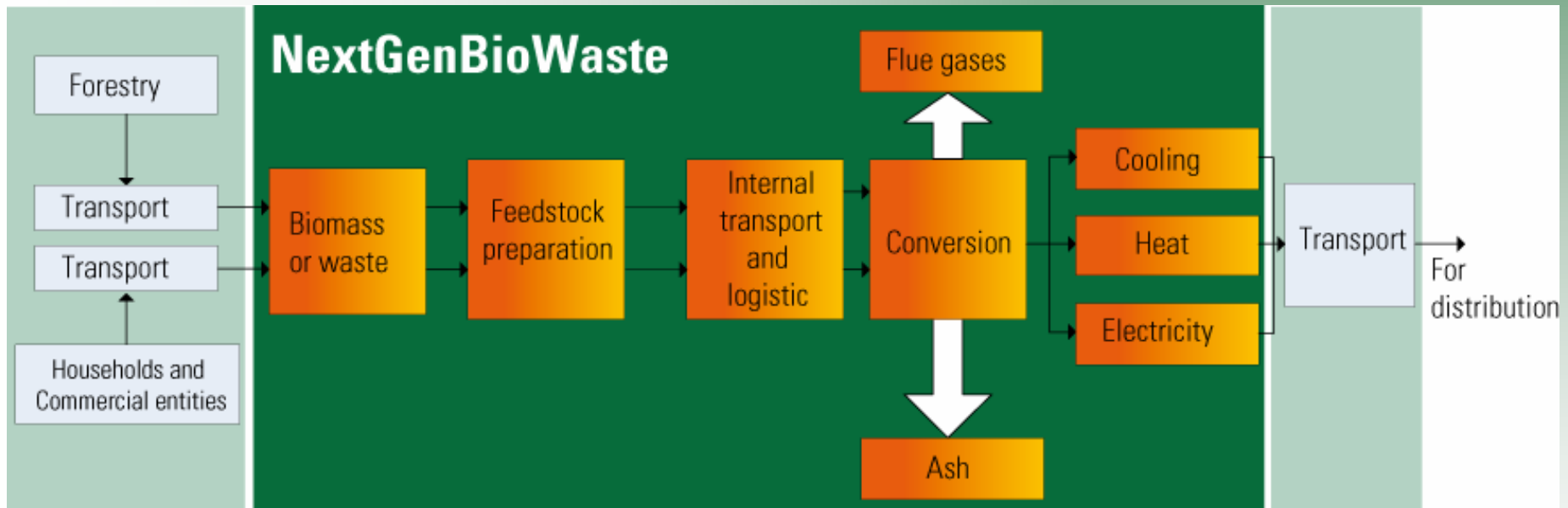
-  Afval Energie Bedrijf, Amsterdam
-  ASM BRESCIA SPA
-  Gemeinschaftskraftwerk Schweinfurt GmbH
-  Joint Research Centre of the EC
-  KEMA
-  Keppel Seghers Belgium NV
-  Max-Planck-Institute
-  N.V. Afvalverwerking Rijnmond
-  SINTEF Energiforskning AS
-  SVUM, a.s., Prague
-  TNO
-  Trondheim Energiverk Fjernvarme AS
-  Vattenfall AB Business unit Nordic Heat
-  Vattenfall Europe Waste to Energy GmbH
-  Vattenfall Power Consultant AB
-  Vattenfall Research and Development AB
-  Visser & Smit Hanab



Objective

The objective of NextGenBioWaste is to demonstrate innovative ways of improving the energy conversion and renewable electricity production using municipal solid waste materials and biomass for large-scale supply of renewable electricity and heating/cooling to end-users - at a more competitive cost and improved environmental parameters.

Scope of NextGenBioWaste



Project Overview

NextGenBioWaste is organised as an integrated project (IP). The Demonstration and RTD activities are structured in 4 sub-projects:

- SP 1 Innovative fuel preparation and mixing
- SP 2 Conversion
- SP 3 Residue handling and use
- SP 4 Dissemination

NextGenBioWaste will:

- Deliver results aimed at accelerating the market penetration of a new generation of biomass and waste combustion plants with particular emphasis on 2010 energy policy objectives.
- Consist mainly of integrated demonstration actions with a research component of approximately 20% as a support for the planning, understanding and further improvement of the demonstrated technologies.
- Demonstrate reduction in the costs associated with implementation of new technologies and demonstrate how the technological solutions can be integrated under full-scale operating conditions. NextGenBioWaste will perform several large-scale demonstrations of different innovative concepts for the energy supply chain.

NextGenBioWaste's Targets

1. Increase the electric efficiency for waste to energy plants from 22% to 30% (gross generated).
2. Double the lifetime of heat exchange components at existing steam temperatures
3. Increase the electric efficiency for biomass combustion plants from 33% to 35%, while making the systems more cost-effective by the use of more low-grade fuels
4. Lower the fuel cost at least 1 mill.€/year for a 100 MW_{th} biomass combustion plant while maintain the two former sub targets (2 and 3).
5. Enable technologies for upgrading of bottom ash, thus, enabling the utility companies to valorise from 70% of their bottom ashes for civil engineering purposes

SP1 Innovative Fuel Preparation and Mixing

Main objective is to demonstrate innovative fuel preparation and mixing in order to obtain:

- More cost-effective fuels or fuel mixtures
- Fuels or fuel mixtures which minimise corrosion and fouling
- More fuel flexible systems which satisfies the need of the customer (e.g. handling of sludge and fuels that will lower the operational and maintenance costs)

Lowering the environmental impact of fuels and further improvements in demonstrated technologies will also be focused

Photo: Deposits on a superheater formed by the combustion of waste wood



SP 2 Conversion technologies

Objectives

- Improving process stability and thus efficiency by improving control concept
- Gathering data with new advanced sensors for model validation and understanding of fouling and corrosion
- Improving electrical efficiency and energy recovery by novel designs and reducing O_2 - level



SP 3 Residue handling and use

Objectives:

- Assessing ash management practices
- Increase market penetration of MSWI bottom ashes
- Develop and demonstrate innovative ash management practice
- Upgrading ashes to regular construction materials



Ashes from incineration



Utilization of MSWI bottom ashes as a road embankment material

SP4 Dissemination

Objectives:

- Promote innovative approaches to the use of improvements to energy recovery and renewable electricity production using waste materials and other commonly available biomass feedstock
- Promote results / approaches and encourage duplication in other countries thereby contributing to EU objectives of CO2 reduction, efficiency improvement and security of energy supply
- Dissemination of the knowledge acquired from the work related to the handbook for improved performance of waste to energy plants (which is a deliverable from SP2).
- Communication with other EU network projects like PREWIN
- Encourage the sharing of policies and knowledge among the participating parties
- Contribute to the communication between within the consortium

Demonstrations on 8 plants in Europe

1. A full-scale demonstration of a retrofit fluidised bed bottom design for combustion of 100% of waste wood fuel in a 100 MWth biomass boiler
2. Large-scale demonstration of advanced control systems enabling plant operators to obtain more stable conditions and improved electrical efficiency
3. Large-scale tests of advanced boiler materials and cladding of superheater surfaces to reduce maintenance costs
4. Large-scale demonstration of advanced combustion techniques using low excess air enabling more compact and cost-effective systems with higher electrical efficiency
5. Full-scale demonstration of high-dust selective catalytic reduction (SCR) of NOx for improved electrical efficiency and environmental performance
6. Full-scale demonstrations on the use of additives in order to reduce operation costs because of decreased fouling and to reduce maintenance costs via an increased lifetime
7. Demonstration of novel design and retrofitting of boilers for improved efficiency
8. Full-scale demonstration of artificial aging of bottom ashes for improved leaching properties giving added value products

For more information

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