



Production of **Solid Sustainable Energy Carriers**
from Biomass by Means of **TORrefaction**



IEA Bioenergy

Market Implementation of a new Solid Biofuel and its midterm Prospects

EU BC&E 2012, Milan - Side Event Torrefaction Workshop

Anders Nordin – Umeå Universitet

Jaap Koppejan – Procede

Jaap Kiel – ECN

Robin Post van der Burg – Topell Energy BV

Wolfgang Stelte – DTI

Klaus Trattner – Andritz

Shahab Sokhansanj – ORNL and UBC



outline of today

No.	Topic	Speaker	Organisation	time
1	Scientific and technical development of Torrefaction and the contribution of SECTOR	Anders Nordin	Umeå Universitet, Sweden	13:30
	<i>Question and Answers</i>			13:55
2	Torrefaction by ECN	Jaap Kiel	ECN, The Netherlands	14:05
3	Torrefaction by Topell	Robin Post van der Burg	Topell Energy BV, The Netherlands	14:30
	<i>Discussion Torrefaction</i>			14:55
	<i>Coffee Break</i>			15:05
4	Densification Concepts	Wolfgang Stelte/Jonas Dahl	DTI, Denmark	15:25
5	Industrial technology process development for torrefied materials - ACB technology	Klaus Trattner	Andritz, Austria	15:50
	<i>Discussion Densification</i>			16:15
6	Developments in North America	Shahab Sokhansanj	Environmental Sciences Division, ORNL and UBC Chemical and Biological Engineering, Canada	16:25
	<i>Discussion North America</i>			16:50
7	Final Remarks and SECTOR outlook	Anders Nordin	Umeå Universitet, Sweden	17:00
				17:10

short introduction of the organisers

DBFZ GGMBH

DBFZ – short introduction

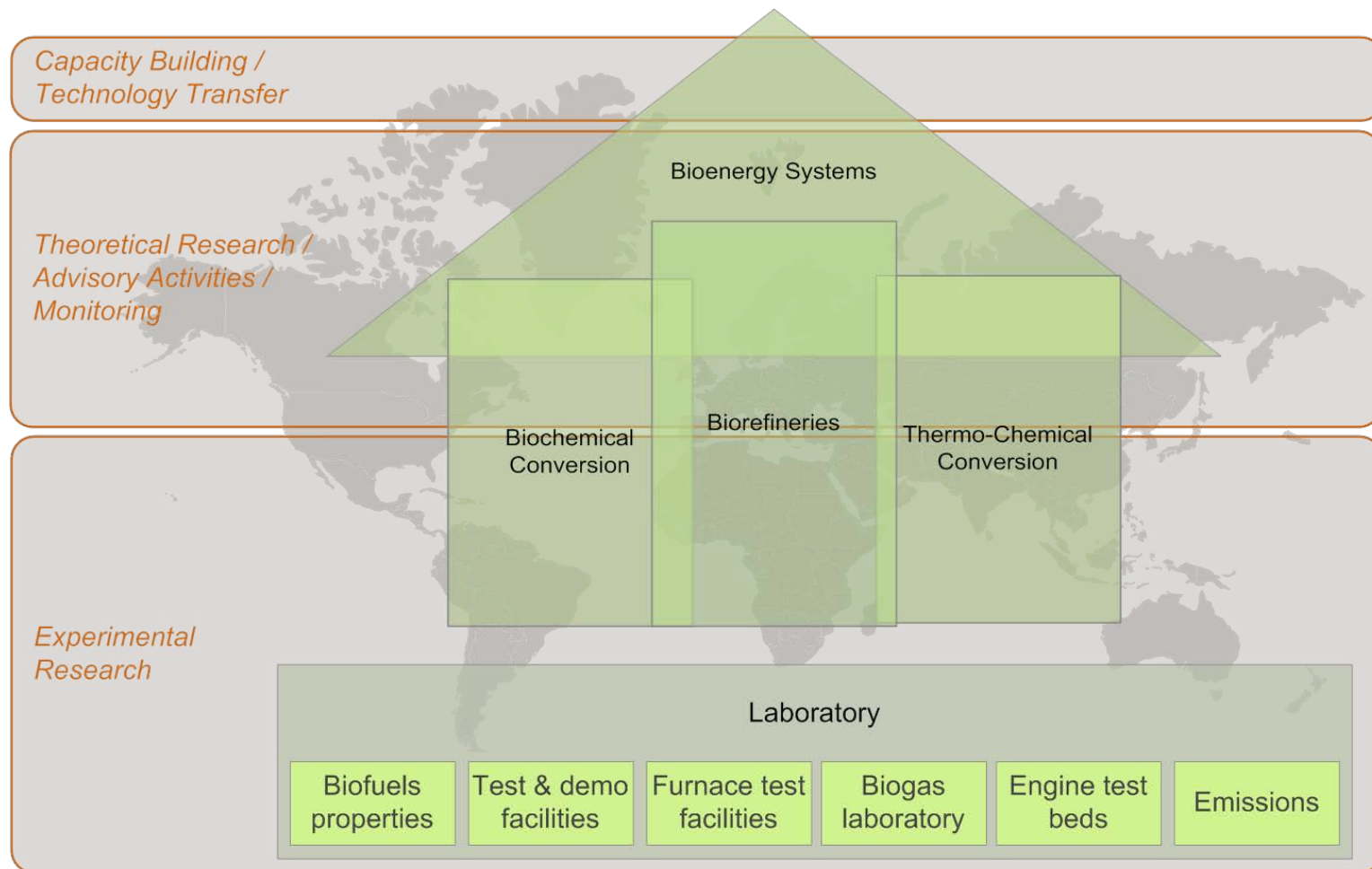
- The German government decided to establish a German Biomass Research Centre within the new Federal States
- This research centre should focus its work on the energy provision from biomass; the use of biomass as a raw material is not within the scope of the centre
- The centre should become a "light-house" within its area of expertise in Germany; additionally the centre should work internationally with a focus on selected regions (i.e. Eastern Europe, Russia, China, Brazil, USA)



DBFZ – goals and tasks

- **Application oriented technical, economic and environmental research and development activities in the field of solid, liquid and gaseous biofuels**
- Testing and certification of solid and liquid biofuels as well as conversion plants for the provision of heat, electricity and/or transportation fuels from biomass
- Consulting of private and public institutions concerning all questions related to "Biomass for Energy"
- Market assessment and data provision in the field of "Biomass and Bioenergy "
- Contributions to national and international committees e.g. for the development of standards and guidelines
- Networking between the relevant national and international players within the biomass and bioenergy business
- Support of Federal Ministries concerning strategic questions in the field of "Biomass and Bioenergy"

DBFZ - structure



short introduction of the organisers

IEA BIOENERGY TASK 32

IEA - International Energy Agency

- The [IEA](#) was founded under the OECD to implement an international energy programme in response to the oil shocks.
- Activities are directed towards collective energy policy objectives of [energy security](#), economic and social development, and environmental protection.
- Activities are set up under Implementing Agreements. There are [40 active Implementing Agreements](#).



IEA Bioenergy tasks

Task 29 : Socio-Economic Drivers

Task 32 : Combustion and Co-firing

Task 33 : Gasification

Task 34 : Pyrolysis

Task 36 : Energy from Solid Waste

Task 37 : Energy from Biogas

Task 38 : Greenhouse Gas Balances

Task 39 : Liquid Biofuels

Task 40 : Bioenergy Trade

Task 41 : Joint project with the Advanced Motor Fuels Implementing Agreement

Task 42 : Biorefineries

Task 43 : Biomass Feedstocks



IEA Bioenergy Task 32: Biomass Combustion and Co-firing

■ Experts from 13 countries:

Austria, Canada, Denmark, Finland, Germany, Ireland, Italy, Netherlands, Norway, Sweden, Switzerland, Turkey, United Kingdom

■ Working together in:

- Cooperative projects
- Meetings, Workshops, Conferences, Excursions
- Cooperation with other Networks

■ Reports etc. can be found on our website:

www.ieabioenergytask32.com



Torrefaction Review

- Review currently led by Procede with inputs of KEMA, TOPELL, NRCAN ...
- Draft to be finalised summer 2012
- General document describing processes available, market developments, financial aspects, etc.



Anders Nordin - Umeå Universitet

SCIENTIFIC AND TECHNICAL DEVELOPMENT OF TORREFACTION



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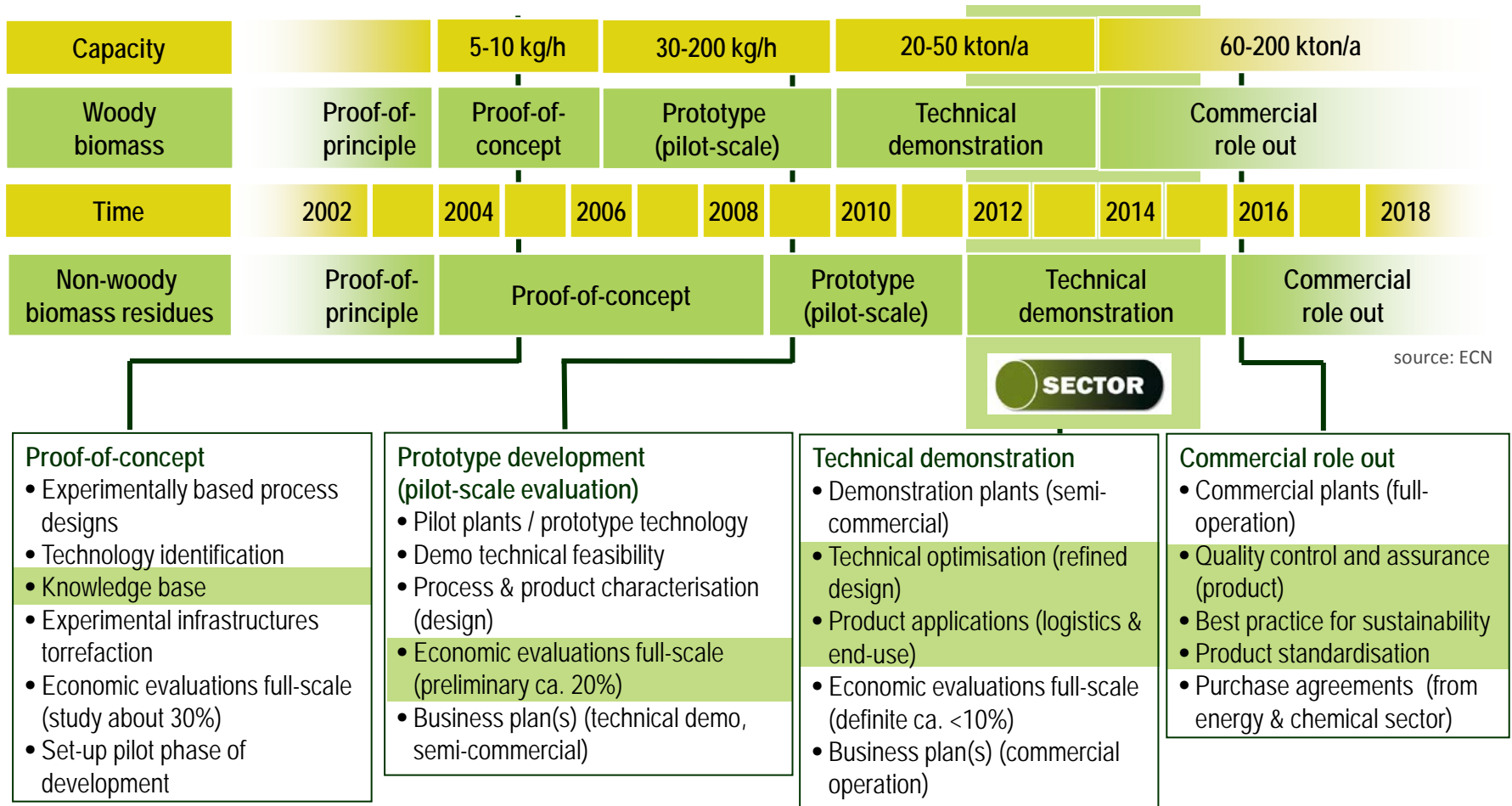


The research leading to these results has received funding from the European Union Seventh Framework Programme FP7/2007-2013 under grant agreement n° 282826

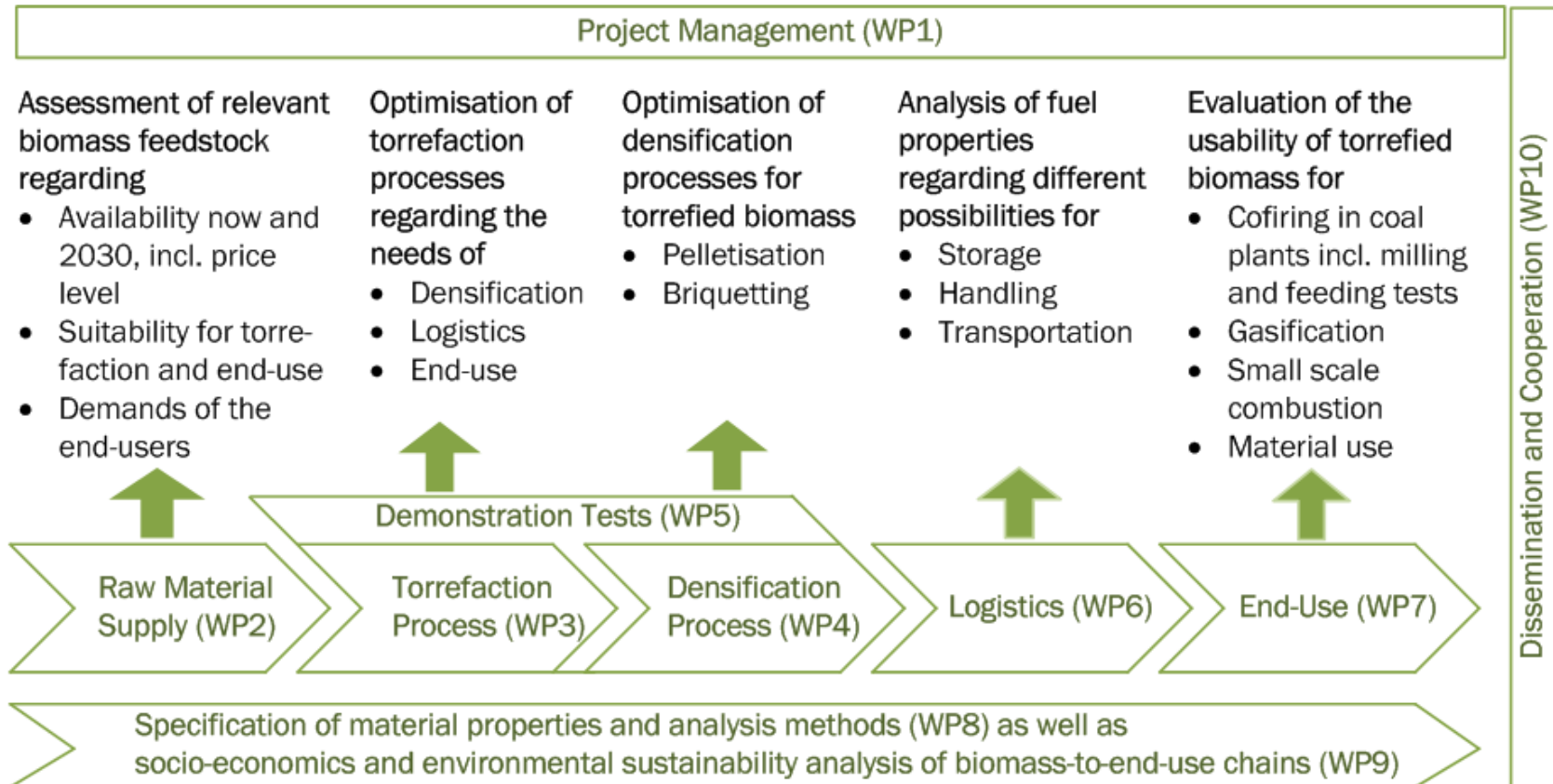
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SECTOR

SECTOR in the roadmap of torrefaction



project structure



project brief

- Collaborative project: SECTOR
- Project start: 01.01.2012
- Duration: 42 months
- Total budget: 10 Mio. Euro
- Participants: 21 from 9 EU-countries
- Coordinator: DBFZ



a pan European consortium



Kick-off meeting at ECN
(14-15 February 2012)



Anders Nordin - Umeå Universitet

SECTOR OUTLOOK



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thank you very much for your attention

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pictures in this presentation: ECN, DBFZ, Procede, Claudia-Hautumm (pixelio), Jasper Lensselink