



IEA ECBCS ANNEX 54 *"Integration of Micro-generation and other Related Energy Technologies in Buildings"* *(2010-2013)*

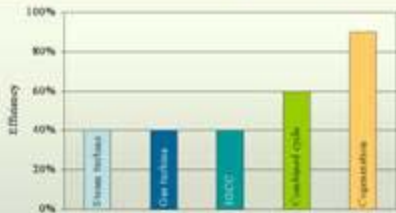
by
Dr. E. Entchev

**NIST MG Workshop
Gaithersburg, MD
October 27 2010**

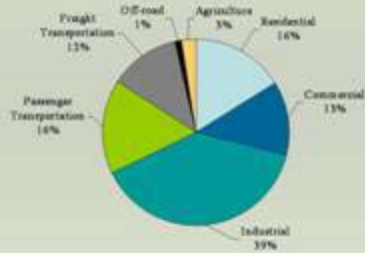
Annex 54 - Objectives

To further develop models of single poly-generation and/or hybrid type micro-generation systems, to assess different applications of these systems, to identify the impact on energy use and GHG emissions, and to investigate the competitiveness of these micro-generation systems to other technologies”

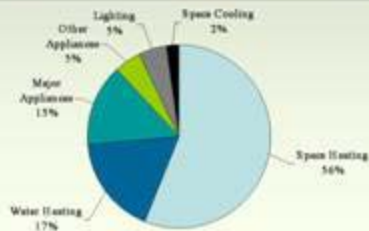
Cycle Efficiency Comparison



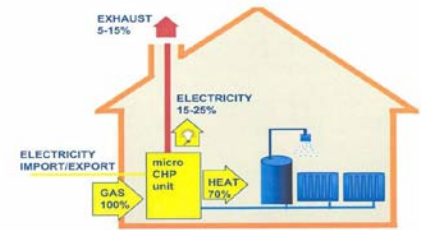
Energy End-Use By Sector



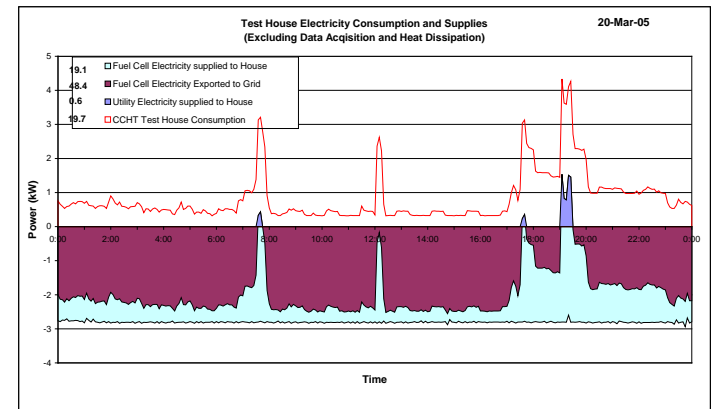
Residential Energy End-Use



Micro CHP concept



Micro CHP replaces boiler in conventional central heating system



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ANNEX 54 Participation : 10 countries; 29 organizations

Belgium	Cogen Vlaanderen
Canada	Natural Resources Canada National Research Council DRDC HYteon IBC
Denmark	Dantherm Power A/S
Finland	Technical Research Centre of Finland (VTT)
Germany	FfE Technical University Munich
Italy	National Agency for New Technologies, Energy and Environment (ENEA) University of Sannio University of Naples

Japan	Tokyo University of Agriculture and Technology Tokyo University Osaka university Nagoya University Tokyo Gas Osaka Gas Toho Gas Saibu Gas Mitsubishi Heavy Industry Ltd Yanmar Energy Systems Ltd
The Netherlands	University of Eindhoven
UK	University of Strathclyde, Scotland Imperial College, England University of Bath, England
US	National Institute for Standards and Technology (NIST)

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Annex 54 - Subtasks

A) Technical Development

This subtask contains a range of activities related to model and load profiles development, data collection and micro-generation systems controls and optimization

B) Performance Assessment

This subtask will use simulations to develop an extensive library of performance studies and synthesis techniques to identify generic trends

C) Technically Robust Mechanisms for Diffusion

The subtask contains work related to the interaction between technical performance, economic instruments and commercialization strategies and provision of this information to the relevant decision makers



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Annex 54 Subtasks

- **Subtask A – Technical Development (Canada)**
(Dr. K. Darcovich, prof I. Morrisson, NRC, CU)
 - Enhanced model development,
 - Extensive laboratory and field testing,
 - Control algorithms and optimization,
- **Subtask B – Performance Assessment (Italy)**
(prof M. Sasso, University of Sannio)
 - Expand the methodology to encompass poly-generation and hybrid systems'
 - Define harmonized set of model characteristics (buildings, systems)
 - Analyze performance of different microgen configuration
- **Subtask C – Technically Robust Mechanism for Diffusion (UK)**
(prof T. Cockerill, Dr. A. Hawkes, Imperial College)
 - Develop regulatory and consumer oriented approaches to support microgen deployment,
 - Identify key drivers for speedy deployment,
 - Case studies and business models.

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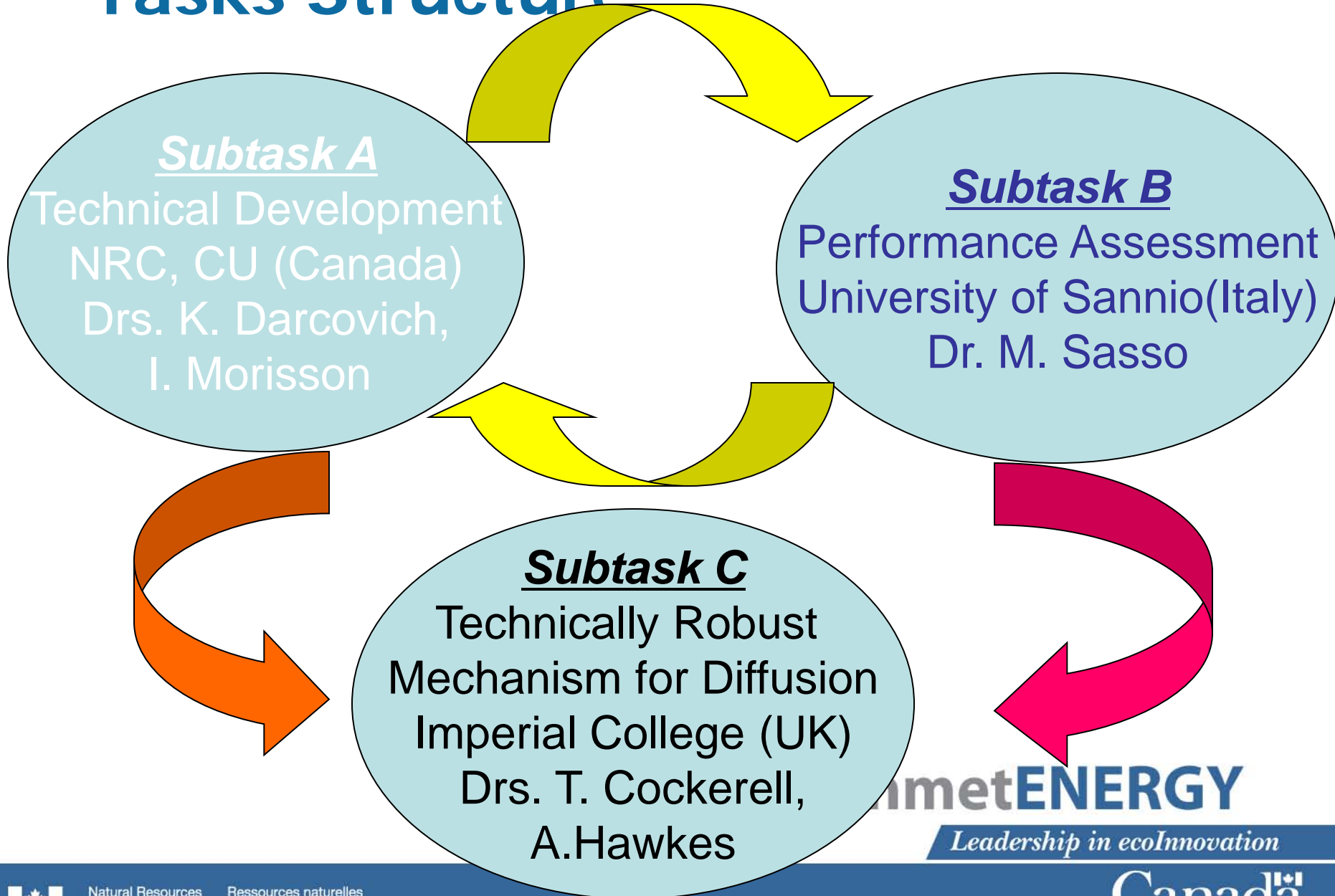


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Tasks Structure



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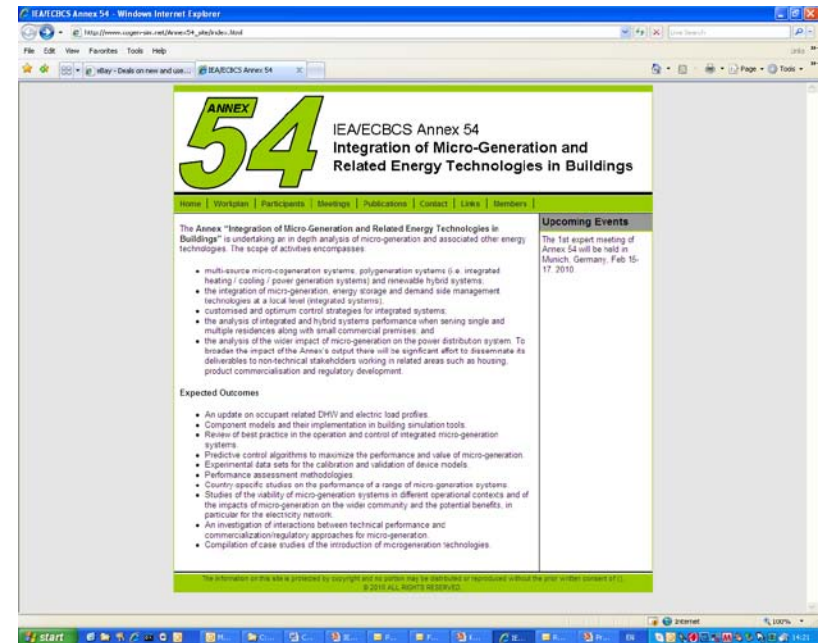
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Annex 54 website

- Launched January 2010

- Web address:
<http://iea-annex54.org/>



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ANNEX 54

IEA/ECBCS Annex 54 Integration of Micro-Generation and Related Energy Technologies in Buildings

[Home](#) | [Workplan](#) | [Participants](#) | [Meetings](#) | [Publications](#) | [Contact](#) | [Links](#) | [Members](#) | [Annex 42 Info](#)

The Annex "Integration of Micro-Generation and Related Energy Technologies in Buildings" is undertaking an in depth analysis of micro-generation and associated other energy technologies. The scope of activities encompasses:

- multi-source micro-cogeneration systems, polygeneration systems (i.e. integrated heating / cooling / power generation systems) and renewable hybrid systems;
- the integration of micro-generation, energy storage and demand side management technologies at a local level (integrated systems);
- customised and optimum control strategies for integrated systems;
- the analysis of integrated and hybrid systems performance when serving single and multiple residences along with small commercial premises; and
- the analysis of the wider impact of micro-generation on the power distribution system. To broaden the impact of the Annex's output there will be significant effort to disseminate its deliverables to non-technical stakeholders working in related areas such as housing, product commercialisation and regulatory development.

Expected Outcomes

- An update on occupant related DHW and electric load profiles.
- Component models and their implementation in building simulation tools.
- Review of best practice in the operation and control of integrated micro-generation systems.
- Predictive control algorithms to maximize the performance and value of micro-generation.
- Experimental data sets for the calibration and validation of device models.
- Performance assessment methodologies.
- Country-specific studies on the performance of a range of micro-generation systems.
- Studies of the viability of micro-generation systems in different operational contexts and of the impacts of micro-generation on the wider community and the potential benefits, in particular for the electricity network.
- An investigation of interactions between technical performance and commercialization/regulatory approaches for micro-generation.
- Compilation of case studies of the introduction of microgeneration technologies.

Annex 54 builds upon the results of Annex 42 "The Simulation of Building-Integrated Fuel Cell and Other Cogeneration Systems". The publications of Annex 42 can be found [here](#).

Upcoming Events

The 2nd expert meeting for annex 54 will be held at the National Institute of Standards and Technology (NIST), in Gaithersburg, MD, USA, Oct 25-27, 2010.



MICROGEN'II 2011

**2nd International Conference and Workshop
on
Microgeneration Systems and Applications**

**April 4-6, 2011
Glasgow, Scotland**



Conferences

- 2nd International conference on Microgeneration
- ~ 120 participants
- Conference organizing and scientific cmt
- Call for Abstracts issued
- Website:

www.supergen-hidef.org/microgenII



The University of Strathclyde in Glasgow is proud to host the 2nd International Conference in Microgeneration and Related Technologies in Buildings - Microgen '11. Glasgow has a worldwide reputation as a welcoming city and is firmly established and experienced as a major centre for conferences and international events.

The conference is multi-disciplinary and is an opportunity for the many disparate stakeholders working in the field to meet and exchange knowledge at a time of rapid technological developments and changes to energy supplies and systems worldwide. Submissions are welcome under the following broad themes:

- Developments in microgeneration and enabling technologies including demand side management
- Practical experiences with microgeneration
- Impact of microgeneration at the large scale
- Modelling and technical analysis of microgeneration systems
- The sustainability of microgeneration
- Societal impacts of microgeneration
- Policy and planning for microgeneration
- Microgeneration markets and economics

A full afternoon of the conference will be industry-focused featuring contributions from industry experts and highlighting commercial perspectives on the future development of technology in this emergent field.

The conference will feature workshops where delegates will have the opportunity to gain "hands-on" experience with some of the cutting-edge software developed for stakeholders in microgeneration from designers to policy makers.

Key dates for submissions and registration are:

2010		2011	
10 September	submission of abstracts	11 February	final papers due
08 October	abstract acceptance	25 February	deadline for early registration
10 December	papers due	04 April	MICROGEN'11 conference
21 January	notification to authors		

Visit our website for the latest information:

www.supergen-hidef.org/microgenII



We look forward to welcoming you to Glasgow,

The Conference Team



Research Infrastructure Canada

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A low-angle, upward-looking photograph of a large tree. The trunk is dark and textured, dominating the lower half of the frame. The branches spread out, covered in dense, bright green leaves that fill the upper two-thirds of the image. The background is a bright, slightly overexposed sky, creating a high-contrast, natural scene. The overall mood is fresh and positive.

THANK YOU!