

**4th IPHE Workshop  
Stationary Fuel Cells  
Report**

**Japan**





## 4th IPHE Workshop Stationary Fuel Cells REPORT

- Date:
  - 1st March 2011
- Place:
  - TOKYO INTERNATIONAL FORUM (Tokyo, Japan)
- Organized by
  - Ministry of Economy Trade and Industry (METI), Japan
  - International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE)
  - New Energy and Industrial Technology Development Organization (NEDO)
  - Technova



## 4th IPHE Workshop Stationary Fuel Cells REPORT

Opening Session 9:40 – 10:00	
	<b>Moderator: Haruhisa Koguchi, METI</b>
<b>9:40 – 9:50</b>	Opening Remarks by METI <b>Kenta Iida</b> , Director, Hydrogen and Fuel Cell Promotion Office
<b>9:50 – 10:00</b>	IPHE Remarks <b>Kai Klinder</b> , Managing Director, NOW GmbH
<b>10:00 – 10:05</b>	<b>Break</b>





## 4th IPHE Workshop Stationary Fuel Cells REPORT

### Government Session 10:05 – 12:00

**Moderator: Haruhisa Koguchi, METI**

10:05 – 10:30	Japan-NEDO <i>Activities of NEDO for practical use of stationary fuel cell systems</i> <b>Atsuo Okawara</b> , Chief Officer, Fuel Cell and Hydrogen Technology Development Dept.
10:30 – 10:55	USA-DOE <i>An Overview of the Status and Plans for Stationary Fuel Cells within the Fuel Cell Technologies Program</i> <b>Rick Farmer</b> , Deputy Program Manager and Chief Engineer for the U.S. FC Technology Program
10:55 – 11:10	<b>Break</b>
11:10 – 11:35	EU-Fuel Cells & Hydrogen Joint Undertaking <i>FCH – JU European public/private joint support for fuel cells and hydrogen activities</i> <b>Mirela Atanasiu</b> , Project Manager Stationary Applications
11:35 – 12:00	Germany-NOW GmbH <i>Cooperation as Success Factor for the German National Innovation Program</i> <b>Kai Klinder</b> , Managing Director, Program Management Stationary Fuel Cells
12:00 – 13:10	<b>Lunch Break</b>



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<b>Parallel Session 1 Residential &amp; Micro CHP Application</b>	
<b>Chair: Osaka Gas Takahiro Kasuh, Associate director, General Manager</b>	
	Japan, Toshiba Fuel Cell Power Systems Corporation
<b>13:10 – 13:30</b>	<b><i>Challenge to expand the commercialization opportunity with residential PEM, ENEFARM</i></b> <b>Yuji Nagata</b> , Technology Executive
	Europe, E.ON Ruhrgas AG
<b>13:30 – 13:50</b>	<b><i>Callux - The German Lighthouse Project for Market Introduction for Domestic Fuel Cell CHP Systems</i></b> <b>Dr. Stephan Ramesohl</b> , Vice President Research and Development
	Europe, Baxi INNOTECH
<b>13:50 – 14:10</b>	<b><i>Baxi Innotech - Gamma 1.0 - Large scale demonstration of residential PEFC systems in Germany - Status and outlook</i></b> <b>Philipp Klose</b> , Devision Manager R&D
	Japan, AISIN
<b>14:25 – 14:45</b>	<b><i>Challenge the commercialization of the residential SOFC CHP</i></b> <b>Koji Kiryu</b> , L&E Development Dept.
	Australia, Ceramic Fuel Cells Ltd.
<b>14:45 – 15:05</b>	<b><i>Challenges in Commercialising an Ultraefficient SOFC Residential Generator</i></b> <b>Dr. Karl Foeger</b> , Chief Technology Officer
	U.S., Clear Edge Power
<b>15:05 – 15:25</b>	<b><i>Commercialization of ClearEdge5 --a 5 kW Fuel Cell System in the USA</i></b> <b>Zakiul Kabir</b> , CTO & Senior Vice President of Engineering
	Korea, KOGAS
<b>15:25 – 15:45</b>	<b><i>Initial Stage of Commercialization of Residential Fuel Cells in Korea</i></b> <b>Dr. Dal-Ryung Park</b> , Principal Researcher, New Energy and Environmental Team, R&D Division



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Parallel Session 2 Industrial Application 13:10 – 15:45	
<b>Chair: Toho Gas Dr. Yasunobu Mizutani, Executive Researcher</b>	
<b>13:10 – 13:30</b>	Japan, Fuji Electric Systems Co., Ltd. <b><i>Present and Future of PAFC at Fuji Electric</i></b> <b>Kenichi Kuroda</b> , Fuel Cell Equipment Dept. Chiba Factory Industrial Solutions Group Environmental Solutions Business Headquarters
<b>13:30 – 13:50</b>	U.S., UTC <b><i>PureCell® Combined Heat and Power Fuel Cell Solutions</i></b> <b>Andrew Dasinger</b> , Sustainable Strategies Leader
<b>13:50 – 14:10</b>	Korea, POSCO Power <b><i>Energy Forever: Fuel Cell Power Business Intro</i></b> <b>Taehyoung Kim</b> , Group Leader, Business Strategy & Marketing Group, Fuel Cell Division
<b>14:35 – 14:55</b>	Japan, Mitsubishi Heavy Industries, LTD <b><i>Current Status and Future Prospects for SOFC Triple Combined Cycle System</i></b> <b>Yoshinori Kobayashi</b> , Deputy General Manager, New energy systems department Power systems headquarters
<b>14:55 – 15:15</b>	Canada, Ballard Power Systems Inc. <b><i>PEM Fuel Cell Systems for Distributed Power Generation</i></b> <b>Jesper Thomsen</b> , CTO, Dantherm Power A/S
<b>15:15 – 15:35</b>	Europe, Wärtsilä Finland Oy <b><i>Status of the Solid Oxide Fuel Cell System Development at Wärtsilä</i></b> <b>Kim Åström</b> , Senior Expert, System Development Product Centre Ecotech



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**Panel discussion: Technology and Market 15:55 – 17:15**

**Moderator: UK Energy Research Centre, John Loughhead**

**15:55 – 16:15** Summary sessions,  
**John Loughhead**, Executive Director, UK Energy Research Centre

**16:15 – 17:15** Discussion

**Closing 17:15 – 17:25**

**17:15 – 17:25** Closing Remarks  
**IPHE, Kai Klinder**, Managing Director, NOW GmbH





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- **Panel discussion: Technology and Market:**

*Moderator: John Loughhead*

- **Summary from Parallel Session 1 Residential & Micro CHP Application**

*by Takahiro Kasuh (Osaka Gas)*

- There are **wide range of system specifications and usages** for residential and micro CHPs. Still, it is generally recognized that **we need technology developments further, and it takes time.**
- For BOP cost reduction, **Japan's R&D on BOP** will provide the best practice.
- To overcome the valley of death, FCs need **incentives** (eg. tax exemption) and **subsidy.**

- **Summary from Parallel Session 2 Industrial Application**

*by Dr. Yasunobu Mizutani (Toho Gas)*

- For industry application, system specifications and technologies are so diverse. Though the discussion, participants can share the best practice.
- Technological tasks are **cost, durability, and energy efficiency.**
- To overcome market barriers, the **clarification of added values for customers** (high energy efficiency, low emission), and the **cost reduction** (fuel cost and operation cost) are necessary.





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- **Summary and Thoughts**

*by John Loughhead*

- The focuses of presentations were on FC systems, not on stacks, fuel cells or transformers. Thus the **technique is now matured** and we are not talking about imagined products anymore.
- The issue is, now, **cost, cost and cost**. We need continued governmental support. In many cases each country tried to gain industrial pay out, but there is **not enough international collaboration**. Also, **industries have to clarify the added value**.
- What we need is;
  - Harmonization not only for system, but also for components
  - Level and nature of subsidies to be defined
  - Consistency of policy
- There are different drivers for changing our energy strategy:
  - (1) energy security,
  - (2) grid + network support,
  - (3) carbon emission reduction,
  - (4) energy efficiency.



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**6 key topics or main hurdles were identified during the discussion**

### **1. Harmonization**

- **How can systems be better standardized** for safety, testing (meaning how to calculate the performance to be comparable), design and insulation.
- How should we work with TC 105?

#### **IPHE task**

Could become a topic for the RCS Working Group?



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### 2. Support Programs

- **The consistency or coherence of policy** on support programs is needed.
- Counting in the technology perspective but also an **understanding of the energy market** is important. How do we manage the variety? Better understanding of the economic drivers and major characteristics of the markets needed.
- Generally, **utilities are conservative** and likely to avoid changes. (they see distributed generators are “enemies”.) Still, there are **possibilities that FCs can help their business** and FCs would minimize their investment. Also, we may learn from solar PV experience (introduction of PVs against the utilities).

#### IPHE task

Comparison of scale of incentives



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### 3. Supply Chain

- Extensive supply chain with different components for different manufactures.
- **Fuel cell industry has a bad reputation** (nobody would like to work with the industry). The **cost targets from the industry are not realistic** for suppliers. Therefore, the industry has to stick to realistic targets.
- Finding ways of **getting a supply chain**, w/o gov money.
- **Could an international supply chain work?** – (i) Sharing information not easy. (ii) Supplier are stronger than system manufactures. Japanese BOP suppliers may be interested in the business with foreign FC system manufacturers.

#### IPHE task

Take lead and talk to companies, help building up a common 50 supplier data base, quality must be assured.



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### 4. Maintenance of operation

- The **system maintenance requires skills and capability** of engineers and technicians.
- Establish the support system and organizations for the services
- We need to **develop maintenance technology and skills**, together with the market growth. Education and training are needed for the market → the **creation of certification** is needed.
- Internet-based control systems and user communication can provide the safety and reduce the maintenance burden of local staff.
- We need to summarize and prepare the maintenance manual and materials on the issues and common understandings on the data.

### 5. Funding

- **Funds should be directed to programs and projects, not to each company** (units).
- It is needed to prepare risk sharing scheme, with which a company might talk with a bank for R&D loans



## 4th IPHE Workshop Stationary Fuel Cells REPORT

### 6. Users

- The clarification of **added values for consumers** is important. The industries can design a system, but still the industry doesn't know how the consumers may use it. And energy consumption patterns really depend on users – the issue of misusing might occur.
- **Costs and reliability are the main issues** (but different behavior in industrial and residential field.)

#### IPHE task

spread the message of H<sub>2</sub> and FC to users



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### Outcome

- We are no longer in the stage of research, we have to built up the market. Therefore:
  1. Convince government to support technology and market development (tax program)
  2. Harmonize RCS
  3. Demo programs are welcome
  4. IPHE could be a platform to communicate how to get to the customers
  5. Reducing costs is up to industry, this could be done via volume
  6. IPHE → Convince government to move to more fair energy prices