Standards for Energy Efficiency of Electric Motor Systems

# SEEEM Side Events at EEMODS'07 13/14 June 2007

# Minutes

Zürich, 20. July 2007, (CUB:c:\daten\seeem\eemods07 side event\side event beijing07 minutes.doc)



## 1 Background

SEEEM is an international multi-stakeholder initiative to harmonize standards for energy efficient motor systems and to coordinate and speed up the energy efficiency impact. The ultimate goal of the SEEEM initiative is to promote rapid market diffusion of high-efficiency motor component technologies and systems worldwide, in order to reduce industrial and building electricity demand and greenhouse gas emissions from electric power generation.

To achieve this objective, the multi-stakeholder SEEEM initiative will facilitate:

- Greater alignment of international testing procedures, performance requirements and labeling schemes and
- Collaboration on the design and enforcement of effective policies and incentives.

The SEEEM side events on 13/14 June 2007 at EEMODS'07 in Beijing briefed participants about the results of the working groups during the first phase 2006/07 and facilitated discussion of priority work for the second phase.

# 2 SEEEM Open Meeting, 13 June 2007, afternoon

**Participants** See Annex 7
**Goal** Review of the work since the Launch in June 2006 in London, widen and strengthen SEEEM impact, discuss future work plan.

## 2.1 Introduction

Conrad U. Brunner gave a brief overview of past, present and future SEEEM activities in the final plenary session, immediately preceding this Side Event.

Today - according to CLASP -10 countries have mandatory MEPS for electric motors: They have together 34% of global population, 44% of global primary energy demand and 47% of global electricity production.

**Summary Table by Economy**

Yv = Yes, voluntary; Ym = Yes, mandatory; U = under consideration

| Economy | Minimum Standard | Labeling | National Test Standard | Reference Test Standard |
|---|---|---|---|---|
| Australia | Ym(1) | | AS 1359.102.1-1997<br>AS 1359.101-1997<br>AS/NZS 1359.102.3:2000 | IEC 61972:2002 |
| Brazil | Ym(1) | Ym(1)<br>Yv(1) | RESP/004<br>NBR 5383/1:1999 (ABNT 1999) | |
| Canada | Ym(1) | | CAN/CSA-C 390-98 | CAN/CSA C390<br>CSA C 390-93 |
| Chile | U(1) | U(1) | | |
| China | Ym(1) | Yv(1) | GB/T 1032-1985<br>GB 755-2000 | |
| Chinese Taipei | Ym(1) | | CNS 14400 | |
| Costa Rica | Ym(1) | Ym(1) | | |
| EU Member Countries | Yv(1) | | | IEC 61972<br>IEC 60034-9 |
| Israel | Ym(1) | | | |
| Malaysia | Yv(1) | U(1) | | |
| Mexico | Ym(1) | Yv(1) | NOM-016-ENER-2002 | |
| New Zealand | Ym(1) | | | |
| Republic of Korea | | Yv(1) | KS C 4202-97<br>KSC 4203<br>KSC 4201 | |
| Thailand | U(1) | Yv(1) | TIS 867-2532 | |
| USA | Ym(1) | | 10 CFR Part 431 Subpart B App. A | |
| Viet Nam | U(1) | | TCVN 2280-78 | |

Information on this page is jointly managed by APEC and CLASP.

Figure 1 CLASP data base on motor MEPS

In the more detailed analysis the following standards are already decided:

| MEPS | Year | 1-phase induction motor | 3-phase induction motor | Pump | Fan | Room AC | Central AC | Chillers | Heat pumps | Compres-sors | population | primary energy | electricity produc-tion |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Australia** | 2000 | | 1 | | | 1 | 1 | | 1 | | **20** | **118** | **239** |
| **Brazil** | 1999 | | 1 | | | | | | | | **186** | **200** | **387** |
| **Canada** | 1998 | | 1 | | | 1 | 1 | | 1 | | **33** | **311** | **576** |
| Chile | ? | 1 | 1 | | | | | | | | *16* | *26* | *51* |
| **China** | 2006 | | 1 | | 1 | 1 | 1 | 1 | | 1 | **1'310** | **1'626** | **2'237** |
| **Costa Rica** | | | 1 | | | 1 | | | | | **4** | | |
| **Israel** | | | 1 | 1 | 1 | 1 | | | | | **7** | | |
| Malaysia | | | | | | | | | | | *25* | *60* | *91* |
| **Mexico** | 2002 | 1 | 1 | 1 | | 1 | 1 | | | | **107** | **144** | **222** |
| **New Zealand** | | | | | | | | | | | **4** | **18** | **43** |
| Philippines | | 1 | | | | 1 | | | | | *89* | *25* | *56* |
| **Taiwan** | | | 1 | | | 1 | | 1 | | | **23** | **98** | **218** |
| Thailand | ? | | 1 | | | 1 | | | | | 65 | 81 | 126 |
| **USA** | 1997 | | 1 | | | 1 | 1 | | 1 | | **298** | **2'324** | **4'148** |
| Vietnam | ? | | 1 | | | 1 | | | | | *83* | *50* | *40* |
| Total | **15** | **3** | **10** | **2** | **2** | **9** | **4** | **2** | **2** | **1** | **2'270** | **5'081** | **8'434** |
| | | | | | | | | | | | **33,6%** | **43,6%** | **47,0%** |
| | | | | | | | | | | | Mio | MToe | TWh |

Table 1 Countries with motor MEPS in 2007 (source: CLASP 2007)

Major new development since the SEEEM launch in London at EEDAL'06 in June 2006:

1. IEA Implementing Agreement „Efficient Electrical End-Use Equipment“ > MOTORS
2. NEMA/ACEEE „Premium shall be MEPS within 3 years“
3. CEMEP declares 12 June 2007 strategy for efficient motors and supports MEPS at Eff 1
4. EuP Eco-design will provide base for European MEPS by 2008
5. International standards
   - IEC 60034-30 Efficiency Classes by 2008
   - IEC 60034-2-1 Harmonized Testing by 2008
   - Testing for compliance with eh Star: Canada, China, IEC round robin
6. Clarification for CDM: small scale and programs

The entire motor efficiency classification will look in 2008 like this:

| Efficiency Levels | Efficiency Classes | Testing Standard | Performance Standard |
|---|---|---|---|
| | **IEC 60034-30** | **IEC 60034-2-1** | **Mandatory** |
| | **Global 2008** | **incl. stray load losses 2008** | **Policy goal** |
| **Super Premium efficiency** | **IE4** | | |
| **Premium efficiency** | **IE3** | | USA 2011 |
| **High efficiency** | **IE2** | | **USA** |
| | | | **Canada** |
| | | | **Mexico** |
| | | | **Australia** |
| | | | **New Zealand** |
| | | | Korea 2008 |
| | | | Brazil 2009 |
| | | | China 2011 |
| | | | Europe 2011? |
| | | | |
| | | | |
| **Standard** | **IE1** | | **China** |
| | | | **Brazil** |
| | | | **Costa Rica** |
| | | | **Israel** |
| | | | **Taiwan** |
| | | | **India** |
| | | | |

Table 2 New IEC Efficiency Classes and time line for countries to have MEPS

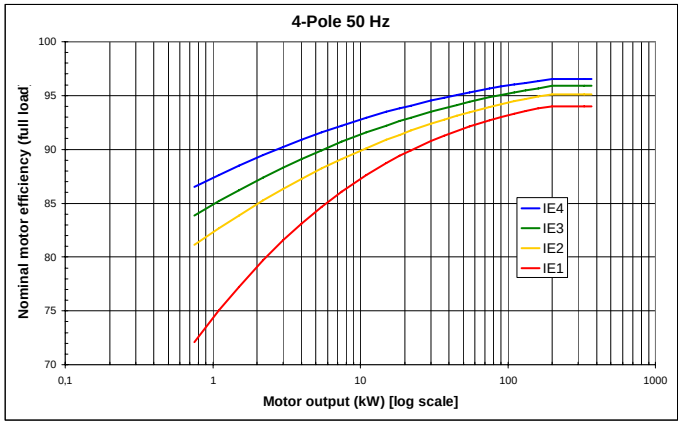



Figure 2 Proposed internationally harmonized Energy Efficiency Classes in IEC 60034-30 (draft May 2007, Martin Doppelbauer)

The motor designation on a rating plate will then look for example like this:

**IE3 - 94.6%**

## 2.2 Reports from Working Groups

**WG 1: Chair Anibal de Almeida**, University of Coimbra, Portugal:

Conclusions of the MS'07 meeting in April in Zurich:

Overview of state of IEC new testing methods IEC 60034-2-1 and IEC new energy efficiency classification IEC 60034-30

The testing standard IEC 60034-2-1 (including eh star) presents different options to take into consideration stray load losses. This is a positive development towards to minimize testing errors and gives the regulator the choice to choose only methods with low levels of uncertainty (that favors the input/output methods like IEEE 112 B). The final draft is out for comments until July 2007. The result can be published 2008.

The new energy efficiency classes in IEC 60034-30 gives 4 levels for motors of 0.75 kW to 370 kW with 2-, 4- and 6-poles for 50 Hz and 60 Hz:

- IE4: New Super Premium Efficiency
- IE3: Premium Efficiency (like NEMA Premium)
- IE2: High Efficiency (like EPAct and Eff 1)
- IE1: Standard Efficiency (like Eff 2)

The second draft will be published in July 2007. The final standard can be published in 2008.

New technological developments (e.g. permanent magnet motors, reluctance motors) can lead to significant improvements particularly for smaller size motors, for which the savings potential is larger. Adjustable speed drives, either integrated with the motors or a discrete component deserve to be addressed because of their huge savings potential.

(Full minutes from Motor Summit'07: www.seeem.org/news)

**WG 2 / 3: Co chair Paul Waide IEA**, Paris France:

Conclusions of the MS'07 meeting in April in Zurich:
Priority 1: Recommend mandatory minimum energy performance standards (MEPS) levels and timetable for implementation

Priority 2: (same rank)
Good practice guidance on methodologies to quantify energy savings & greenhouse gas emission reductions
Exchange experience and cooperate on policies & incentives that build on standards

Priority 3: Input into policymaking processes (which was regarded as a crucial ongoing task, rather than a specific activity).

(Full minutes from Motor Summit'07: www.seeem.org/news). In addition, Paul Waide informed on broader policy developments, particularly the G8 (and G8+5) processes and plans for an IEA Implementing Agreement on Energy Efficiency End-Use Equipment, which includes an Annex on motors. The 2007 G8 meeting endorsed 16 recommendations made by the IEA on energy efficiency, including the introduction of minimum energy performance standards on motors.

## 2.3 International reports

**Rob Boteler NEMA, USA**

NEMA and ACEEE requested the US Congress to raise existing MEPS at EPAct level to Premium level with 3 years and to expand coverage to more motor types. Closing of existing loopholes is major issue.
http://www.nema.org/media/pr/20070328b.cfm

**Martin Doppelbauer, Chair IEC WG 31/SEW-Eurodrive, Germany**

IEC 60034-30: Motors with 0.75 kW to 370 kW, with 2-, 4- and 6 poles, second draft to be published for comments in July 2007. New motor classes IE4/IE3/IE2/IE1 (see Table 2 above). Harmonizing values between 60 Hz and 50 Hz.

IEC 60034-2-1 testing method (in final vote now): Round robin test to secure accuracy and repeatability of eh Star method. See draft on www.seeem.org/news

"Guide for the selection and application of energy efficient motors including variable speed applications" to be published (based on NEMA MG10 -2001 "Energy Management Guide for Selection and Usage of Fixed Frequency Medium AC Squirrel-Cage Polyphase Induction Motors).

**Chen Weihua SEARI, Shanghai, China**

Report on testing activities and capabilities at SEARI. Presentation of results of 7 motors tested under IEC 61972 and IEC 60034-2-1 (eh star) (see also separate SEEEM paper on Testing Methods: www.seeem.org/news )

**George Soares Electrobras, Brazil**

Importance of addressing MEPS implementation issues when establishing legal basis for MEPS. Importance of requiring OEMs to put additional motor nameplate on the outside of the integrated equipment (which is done in some, but not all cases).

**Kei Konishi JEMA, Japan**

Information on Japan plan to adopt IEC 60034-30 efficiency classes and to support new IEA Implementing Agreement on energy efficiency of end-use equipment.

**Terry Collins, New Zealand**

Reported that NZ is working towards mutual recognition agreements with labs in China and Taiwan to avoid the need to build new testing labs. He also suggested the need for customs codes for motors that would facilitate compliance enforcement.

**Brenton Watkins for AGO, Australia**

Informed that Australia will adopt the IEC 60034-30 efficiency classes and the new IEC test method, but that they were not happy to have the Eh Star method included.

**G.P. Pandian, Bureau of Energy Efficiency, India**
(presented at internal meeting 14 June 2007)

Reported on Indian plans to promote high efficient motors / systems. The group also suggested that while starting with MEPS at the Eff2 level, it might be advisable to announce a future increase to Eff1 (with adequate time for adjustment) to send a clear signal to local manufacturers. This had been discussed in India extensively, but rejected. The MEPS is to apply to both motors manufactured for export and for the domestic market.

## 2.4 Discussion of Work Plan 2007/08

***Motor database***: A feasibility study is required to determine whether a global database of high efficient motor market penetration can be created, to collect existing data, who might be able to do this work and what it would cost. Future collaboration with IEA new Implementing Agreement on energy efficient end-use equipment (Annex motors).

***Topten Motors***: Those present were not supportive of SEEEM work on a "Topten System" for motors comparable to consumer products (see www.topten.info). Issues raised were legal liability, unsuitability to needs of users, availability of more appropriate tools such as EuroDEEM and MotorMaster+ International.

***Motor Policy Roadmap / high-efficiency systems***: No comments on these two Work Plan items.

***Integrated motor systems***: Hugh Falkner expressed the opinion that this subject required more thought and recommended that SEEEM should await the outcome of the relevant Ecodesign EuP studies in Europe.

## 2.5 Insights and Conclusions

- New US legislation starts to close loophole in MEPS for special applications. This can cut the 30% market share for non-MEPS today in half in the future.
- Round robin test in IEC will secure testing method and recruit new testing labs.
- For non-MEPS countries (Europe, Japan, China, etc.) to go in one step for MEPS at IE3 level is difficult because of small motors (< 5 kW) and their frame sizes. China is not moving to IE2 motors in the small sizes in 2011 standard because of the frame size limitations.
- To have MEPS for motors decided and regulation in place is fine, but it needs an implementation, monitoring and enforcement program (including sanctions).
- Imported motors need specific custom code in order to be better recognized.
- OEM systems need additional external name plates.
- Need to consider how to avoid dumping of outdated motor technology in countries without MEPS, especially developing countries.

# 3 SEEEM Internal Meeting, 14 June 2007, morning

**Participants** See Annex 7
**Goal** Set goals and work plan for next phase, secure adequate funding.

## 3.1 Introduction

The discussion on the future role and work of SEEEM was based on an introduction on expanding to pump systems by Hugh Falkner AEA, a short review of the activities since 2005, a proposed set of major activities by the coordinator, and the subsequent discussion and decisions on the future work plan.

## 3.2 SEEEM role in motor systems

Hugh Falkner (AEA MTP UK, project manager for EuP lot 11: pumps) reported on European work on pump standards since 1996. The EuP study on pumps will be available in draft form in September 2007, will be discussed at a stakeholder meeting in October and finalized by the end of 2007.

- Would be good for SEEEM to address pumps in some way, perhaps by propagating international dialog on standards (such as a "good" / "better" / "best" scheme), keeping in mind that the proper use of the pump is more important than whether it is high-efficiency
- SEEEM should also consider compressed air systems (after pumps), as these are also relatively easy to address

## 3.3 SEEEM review Preparatory Phase and Phase I (2005/06 and 2006/07)

Report on the activities and the budget:

**Preparatory Phase (2005/2006)**

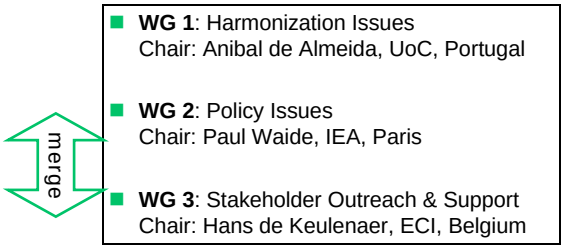
- September 2005 EEMODS'05 Heidelberg
  - Workshop invited by Paolo Bertoldi
- April 2006 New York
  - Technical Advisory Group
- May 2006 Paris
  - IEA Motor Workshop

**Implementation Phase I (2006/07)**

- June 2006 EEDAL'06 London
  - SEEEM launch: Community of Practice, Working Groups
- June 2006 EuP Brussels
  Stakeholder meeting 1 lot 11: motors & pumps
- October 2006 Frankfurt
  - 1st IEC WG 31 meeting
- April 2007 Motor Summit 2007 Zurich
  - SEEEM meeting: priorities second phase
- May 2007 EuP Brussels
  Stakeholder meeting 3: motors & fans
- May 2007 IEC / NEMA Washington DC
  - Coordination 50 Hz / 60 Hz
  - 2nd IEC WG 31 meeting
- June 2007 eceee
  - Summer Study Nice France
- June 2007 EEMODS'07 Beijing
  - SEEEM meeting: work second phase

- Communication
  - News (3 infos per year)
  - Web
  - Media:
    Motor & Drives UK (after Launch at EEDAL'06)
    Swiss Electro Bulletin (before and after MS'07)
  - IEEE meeting Baltimore (October 2007)

**Working Groups: WG 2 and WG 3 to be merged**



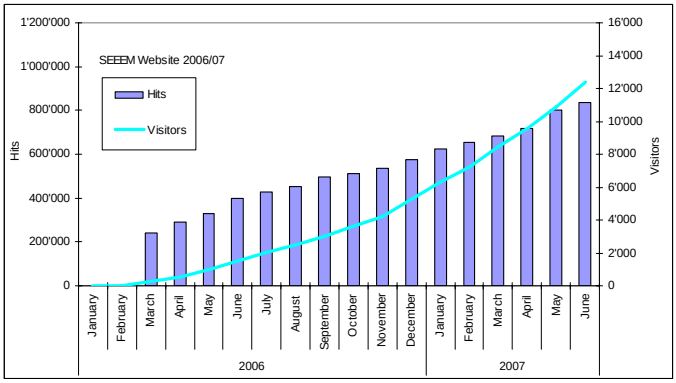




Figure 3 Web www.seeem.org cumulative Hits and Visitors

## 3.4 SEEEM Implementation Phase II (2007/08) Work Plan

**Organization & Goals**

The proposed general framework to strengthen the organization and the goals was discussed and approved. The quantitative concept of targeting major economies to get them involved in MEPS was explained in table 3.

- Organization
  - Strengthen global reach
  - Cooperate with international organizations:
    - EuP Ecodesign
    - IEC Standards
    - ITFSP
    - IEA IA
    - UNDP/UNEP GEF
    - CLASP
    - APP
    - REEEP
  - Secure sustainable funding
- Goal
  - More countries with MEPS at **IE3** level
  - Industrialized **plus** developing countries

New target countries for MEPS to achieve over 80% of global electricity production (including the European Union as on group) see table 3:

| | | Population | | | GDP | | | Electricity | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Mio | % cumul | | Mio US $ | % cumul | | TWh/a | % cumul | |
| 1 | China | 1'322 | 20,0% | | 2'229 | 5,0% | | 2'475 | 13,6% | MEPS |
| 2 | India | 1'130 | 37,1% | | 785 | 6,8% | | 679 | 17,3% | |
| 3 | EU 25 | 456 | 44,0% | | 13'577 | 37,4% | | 3'039 | 34,1% | |
| 4 | United States of America | 301 | 48,6% | | 12'455 | 65,4% | | 4'239 | 57,4% | MEPS |
| 5 | Indonesia | 235 | 52,2% | | 287 | 66,1% | | 123 | 58,0% | |
| 6 | Brazil | 190 | 55,0% | | 794 | 67,9% | | 405 | 60,3% | MEPS |
| 7 | Pakistan | 165 | 57,5% | | 111 | 68,1% | | 96 | 60,8% | |
| 8 | Bangladesh | 150 | 59,8% | | 60 | 68,3% | | 23 | 60,9% | |
| 9 | Russia | 141 | 62,0% | | 581 | 69,6% | | 952 | 66,2% | |
| 10 | Japan | 127 | 63,9% | | 4'506 | 79,7% | | 1'134 | 72,4% | |
| 11 | Mexico | 109 | 65,5% | | 768 | 81,5% | | 233 | 73,7% | MEPS |
| 12 | Thailand | 65 | 66,5% | | 176 | 81,8% | | 575 | 76,8% | |
| 13 | Korea, South | 49 | 67,3% | | 788 | 83,6% | | 395 | 79,0% | 2008 |
| 14 | South Africa | 44 | 67,9% | | 240 | 84,2% | | 245 | 80,4% | |
| 15 | Spain | 40 | 68,5% | | 1'124 | 86,7% | | 292 | 82,0% | |
| 16 | Australia | 20 | 68,8% | | 701 | 88,3% | | 243 | 83,3% | MEPS |
| 17 | Canada | 33 | 69,4% | | 1'115 | 90,8% | | 594 | 86,6% | MEPS |
| | Total | **4'579** | | | **40'296** | | | **15'742** | | |

Table 3 Target economies for expanding MEPS for motors (marked in red)

**The result of the discussion of the work plan:**

1. Inform on new global standards & labels and higher efficiency technologies (share front runner experience)
2. General tasks
   - Stimulate incentive programs
   - Pool tools and guides for best practice
   - Life cycle perspective, deal with old motors
3. Build database global market & energy (with IEA)
4. Road map for policy development for MEPS: Strategy to stimulate MEPS at the most ambitious and achievable level: Target key economies
5. Testing facilities: assess qualification & capacity, explore options for sharing tf capacity and mutual recognition, if necessary stimulate new capacity
6. Start concept for integrated motor systems: ASD's, pumps, compressors
7. Proposal to contribute with APP process: China, US, India, Japan
8. Update info for governments in the policy processes (G8 etc.) (yearly update)

## 3.5 SEEEM Budget and Funding

In order to continue the SEEEM activities at present level a minimal budget of 160 kEuro for 2007/08 was proposed. In order to expand and intensify the activities according to the 8 points above an optimal budget of 320 k Euro is necessary. The detailed work plan will be decided based on the result of the funding efforts.

- Various suggestions for new sources of SEEEM support were made, and it was agreed to form a Financing Committee, Chaired by John Mollet ICA, Paul Waide and (to be invited by John Mollet) Steven Nadel ACEEE, to create a strategy to secure funding for SEEEM going forward, assessing the various alternatives and their pros/cons.
- SEEEM has been invited by the AGO to submit a funding proposal for services in support of the APP work on motor harmonization.
- Another potential source to be pursued is the Intelligent Energy Europe program – NL, SE, PL agreed to work together on a proposal to obtain EU support for SEEEM.

## 3.6 Governance

- Conrad U. Brunner, A+B International has the support of SC members to serve the role of SEEEM coordinator through EEMODS'09.

- There is a need to agree a governance structure appropriate to the nature of SEEEM – secretariat should propose governance structure to be adopted now and reviewed in 2009 and periodically thereafter.
- Steering Committee: membership should reflect the functions to be performed by the body. The coordinator was given the liberty to ask new members from countries like Japan, India, Canada and South Africa.

## 3.7 Press Release

- Individual feedback to the draft was taken into the final version. It was suggested to add more information on who is now involved in the SEEEM community of practice.

# 4 Annex: Session 1 (Agenda)

**Open meeting of the SEEEM Community of Practice**

| | | |
|---|---|---|
| 15 30 | Welcome and general introduction<br>Report from MS'07<br>(see "Conclusions" in www.seeem.org/news) | Conrad U. Brunner |
| 16 00 | Report WG 1<br>"Harmonization Issues" | Anibal de Almeida (University of Coimbra) |
| 16 10 | Report WG 2<br>"Policy Issues" | Paul Waide (IEA) |
| 16 20 | Report on specific points:<br>▪ NEMA new MEPS<br>▪ EU Ecodesign EuP motors (Lot 11)<br>▪ IEC 60034-30<br>▪ IEA new Implementing Agreement on energy efficient end-use equipment | <br><br>Rob Boteler (NEMA)<br>Anibal de Almeida (UoC)<br><br>Martin Doppelbauer (Chair TC 2/WG 31)<br>Paul Waide (IEA) |
| 17 00 | Reports from regional/national contributors | 1. USA: Rob Boteler (NEMA)<br>2. China: Chen Weihua (SEARI)<br>3. India: G.P. Pandian (second session)<br>4. South America: George Soares (Electrobras)<br>5. Japan: Kei Konishi (JEMA)<br>6. New Zealand: Terry Collins (EECA)<br>7. Australia/AP6: Shane Holt, Brenton Watkins (AGO) |
| 17 30 | Discussion of Work Plan Phase II (2007/08), follow up | (List of proposed tasks will be provided)<br><br>Everybody |
| 18 00 | Media statement, conclusions | Conrad U. Brunner |
| 18 30 | Reception | |
| 19 00 | Dinner | |

# 5 Annex: Session 2 (Agenda)

**Internal SEEEM meeting (SC, TAG, WG and guests)**

| | | |
|---|---|---|
| 09 00 | Welcome and introduction | Conrad U. Brunner |
| 09 30 | Review Phase I (2006/07) | (list of highlights will be provided) |
| 10 00 | Planning Phase II (2007/08) | (list of specific tasks and budget will be provided)<br>1. Road map for more motor MEPS countries (including developing countries)<br>2. Explore scope for work on pumps, fans, etc.<br>3. New motor technologies: need for standard?<br>4. Cooperate with AP6, ITFSP, CLASP, IEA new IA and GEF UNDP/UNEP<br>5. Provide and expand list of global availability of independent motor testing laboratories<br>6. SEEEM update report for G8, UNFCCC and other upcoming policy processes (together with IEA?)<br>7. Start Outreach campaign: Priority countries |
| 11 00 | Budget and financing 2007/08 | Present funders:<br>1. AGO Australia<br>2. MTP UK<br>3. Natural Resources Canada (in kind for testing)<br>4. ICA<br>5. Swiss Federal Office of Energy (in kind for MS'07)<br>6. SenterNovem The Netherlands<br>**New funders are necessary!** |
| 11 30 | New members of SC | Potential regions to be included:<br>▪ Japan<br>▪ India<br>▪ South Africa<br>▪ Canada |
| 12 00 | Media Statement<br>Lunch | |

# 6 Annex: Relevant SEEEM papers

SEEEM papers see www.seeem.org

- SEEEM Press Release 14 June 2007 Beijing
- MS'07 SEEEM meeting on 9 April 2007, Minutes
- International Standards for Electric motors, Status 20 July 2007

EEMODS'07 paper presentations (in the SEEEM context, eventually available at www.eemods.cn ):

- Anibal de Almeida et al. (University of Coimbra): Eco-Design of Electric Motors
- M'hammed Aoulkadi, Andreas Binder (University of Darmstadt): Influence of Auxiliary Impedance on Stray Load Loss Determination with eh-Star method.
- Anne Arquit Niederberger et al. (A+B International): Promotion of High Efficiency Electric Motor Systems under the Clean Development Mechanism
- Paolo Bertoldi: White Certificates and their Application to Motor Systems Projects
- Rob Boteler (NEMA): NEMA Premium Update.
- Conrad U. Brunner et al.: Standards for Energy Efficient Electric Motor Systems SEEEM: Building a Worldwide Community of Practice
- Frank Cerra et al. (AEEMA): Industry Participation in the Australian MEPS Program
- Terry Collins (EECA): New Zealand Pilot Toward Accelerating the Adoption of MEPS-complaint Motors
- Hugh Falkner & Charles Gaisford (AEA MTP UK): The Energy Using Product (EuP) Directive Preparatory Studies Applying the MEEEUP Methodology for Motors, Fans, Pumps and Circulators
- Charles Gaisford (AEA MTP UK): Development of Policy Measures in the UK to Improve Pump System Efficiency
- Frank Hartkamp et al. (SenterNovem): Electric Motor Driven Systems within the Long Term Agreement on Energy Efficiency in Industries in the Netherlands
- Kei Konishi (JEMA): The Energy Saving Challenge of Motor Using Equipment in Japan
- John R. Mollet (ICA): Energy Efficiency in Select Motor Driven Systems within the Asia-Pacific Partnership on Clean development and Climate
- Jürgen Sander (CEMEP): The Proactive Role of the Motor Industry in the Field of Energy Efficient Motor Driven Systems
- George Soares (Electrobras), et al.: Brazilian Industrial Energy Efficiency Program: Learned Lessons
- Martin Doppelbauer (SEW Eurodrive): Strategy and Status of IEC project 60034-30 Efficiency Classes of Cage Induction Motors
- Glenn Widerström (Swedish Energy Agency): A Swedish Energy Efficiency Management Project for Motor Driven Systems in Mining, and Steel Industry
- Zhao Victor (ICA): Current Market Situation and Development of Chinese High Efficiency Motor
- Zhang Xin (CNIS): Mandatory Reach Energy Efficiency Standards for Pumps
- Zhao Yuejin (CNIS): General Situation of Energy Conservation for China's Motor System

# 7 Annex: Participants

In all 39 participants from 18 countries.

Members of the SEEEM Community of Practice:

| Steering Committee* | Working Group chair | Technical Advisory Group member | Coordinators (A+B Interna-tional) | Independent Experts |
|---|---|---|---|---|
| 8 | 2 | 4 | 2 | 23 |

*) including their representatives

| 13 June afternoon | 14 June morning | Name | First Name | Organization | Country |
|---|---|---|---|---|---|
| 1 | 1 | Arquit Niederberger | Anne | A+B International | USA |
| 1 | | Bertoldi | Paolo | EC DG JRC | Italy |
| 1 | 1 | Boteler | Rob | NEMA | USA |
| 1 | 1 | Brunner | Conrad U. | A+B International | Switzerland |
| 1 | | Brzoza-Brzezina | Krysztof | KAPE | Poland |
| 1 | | Cerra | Frank | SEW Eurodrive | Australia |
| 1 | | Chen | Weihua | SEARI | China |
| 1 | | Collins | Terry | EECA | New Zealand |
| 1 | 1 | De Almeida | Anibal | U of Coimbra | Portugal |
| 1 | | Doppelbauer | Martin | SEW Eurodrive | Germany |
| 1 | | Ernedal | Sven | EU China EEP | China |
| | 1 | Falkner | Hugh | AEA | UK |
| 1 | 1 | Gaisford | Charles | AEA | UK |
| | 1 | Garcia | Glycon | ICA | Brazil |
| | 1 | Hartkamp | Frank | SenterNovem | Netherlands |
| 1 | 1 | Holt | Shane | AGO | Australia |
| 1 | | Hoyt | William | NEMA | USA |
| 1 | | Konishi | Kei | JEMA | Japan |
| 1 | 1 | Li | Xiu Ying | SEARI | China |
| 1 | | Liang | Daniel | ICA | China |
| 1 | | Liszka | Szymon | FEWE | Poland |
| 1 | | McCoy | Gilbert | WSU | USA |
| 1 | 1 | Mollet | John | ICA | USA |
| | 1 | Pandian | Gopal | BEE | India |
| 1 | | Pandit | Nitin | IIEC | USA |
| 1 | 1 | Qin | He | SEARI | China |
| 1 | | Skoczkowski | Tadeusz | KAPE | Poland |
| 1 | 1 | Soares | George | Electrobras | Brazil |
| 1 | | Tan | Peng Yong | Baldor | Singapore |
| 1 | | Teepe | Markus | Europump | Germany |
| 1 | | Tolvanen | Jukka | ABB | Finnland |
| 1 | | Waide | Paul | IEA | France |
| 1 | | Watkins | Brenton | AGO | Australia |
| 1 | 1 | Widerström | Glenn | STEM | Sweden |
| 1 | | Williamson | Steven | U of Manchester | UK |
| 1 | | Woon | Antony | ICA/CDC | Singapore |
| | 1 | Yang | Xiu Jun | Hebei Motors | China |
| 1 | | Zhao | Yuejin | CNIS | China |
| 1 | | Zhou | Victor | ICA | China |

## 8 Coordination and Contact Information

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|---|---|
| Coordination | A+B International (Sustainable Energy Advisors)<br>(invitation, agenda, moderation, minutes) |
| Logistics | EEMODS'07/ICA |
| Language | English (Session 1: Chinese sequential translation) |
| Web | www.seeem.org<br>www.eemods.cn |
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