

## UNIDO with IAEA: **Submission on Behalf of UN-Energy**

### ***Advancing Industrial Energy Efficiency (IEE) under the Bali Road Map***

#### **Background**

UN-Energy was established to help ensure coherence in the UN system's multi-disciplinary response to the energy-related outcomes of the World Summit for Sustainable Development (WSSD) and to promote system-wide collaboration in the area of energy, with a coherent and consistent approach, since there is no single entity in the UN system that has primary responsibility for energy<sup>1</sup>.

As an input into the UNFCCC/Kyoto Protocol Bali Road Map (BRM) negotiation process, UN-Energy (Energy Efficiency Cluster) conducted an Expert Group Meeting (EGM) on Industrial Energy Efficiency (IEE)<sup>2</sup> in Washington, D.C., on 22/23 September 2008. One immediate output of the EGM is this submission by UNIDO (as the current chair of UN-Energy and cluster leader) with the IAEA (as cluster co-leader) on behalf of UN-Energy in response to the call for ideas and proposals on elements contained in Paragraph 1 of the Bali Action Plan included in FCCC/AWGLCA/2008/L.7.

This submission reflects the collective views expressed by 35 experts and UN agency representatives present at the EGM. A full workshop report and an in-depth issue paper elaborating these points will be available by COP14 and will be discussed at a UN-Energy Side Event in Poznan in December 2008. The purpose of this submission is to help encourage investments in energy efficiency and promote the transfer and diffusion of energy-efficiency technologies and practices under the Bali Action Plan.

#### **Introduction**

Global assessments of the Intergovernmental Panel on Climate Change (IPCC, 2007) and the International Energy Agency (IEA, 2008)<sup>3</sup> point to the need and key role of improving industrial energy efficiency (IEE), while assessing the technology deployment required to meet stabilization targets. However, the uptake of energy efficiency projects under the Kyoto Protocol's Clean Development Mechanism (CDM) remains limited and well short of either the potential or levels required by the assessment scenarios. As meeting reduced levels of CO<sub>2</sub> emissions is an essential part of the Bali Road Map shared vision, it is inexorably linked with large-scale IEE improvements.

By energy efficiency we mean providing more service (such as motive power or process heating) or more output (such as producing a ton of steel) while using less energy. This can be achieved by using improved technology, changes in processes and systems, altering behaviour as well as improved management practice. Essentially this is the same as using energy more productively than in normal business as usual practice<sup>4</sup>. Conceptualised in this way, improved energy efficiency can help increase access to essential energy services as countries develop as well as improve the economic efficiency of industrialised nations<sup>5</sup>. Furthermore, it is useful to distinguish between accelerating the deployment of existing best practice and new "breakthrough" efficient end-use technologies, systems and processes.

The next section represents the collective views expressed by participants of the EGM. As such, they do not necessarily reflect the views of UN Energy. (Please note that for cross-referencing purposes, paragraphs are labelled corresponding to negotiation tracks: S – Shared Vision, M – Mitigation, T – Technology Transfer and F – Financing.)

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<sup>1</sup> UN Energy members include: Economic Commission for Africa, Europe, America and the Caribbean; Economic and Social Commission for Asia and the Pacific, Western Asia; Food and Agriculture Organization; International Atomic Energy Agency; UN Human Settlements Programme (HABITAT); UN Conference on Trade and Development; UN Development Programme; UN Educational, Scientific and Cultural Organization; UN Environment Programme; UN Framework Convention on Climate Change; UN Industrial Development Organization; UN International Research and Training Institute for the Advancement of Women; World Health Organization; World Meteorological Organization; World Bank; Department of Economic and Social Affairs; Chief Executive Board Secretariat

<sup>2</sup> Although the EGM was focused on industrial energy efficiency, many of these recommendations are relevant to energy efficiency more broadly.

<sup>3</sup> IPCC, 2007: Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp. <http://www.ipcc.ch/ipccreports/ar4-syr.htm>. IEA 2008, Energy Technology Perspectives <http://www.iea.org/Textbase/techno/etp/index.asp>

<sup>4</sup> This is a most distinct notion from simply using less energy, or less energy service. In countries where energy poverty limits development, increased energy productivity/energy efficiency can significantly help increase access to energy services.

<sup>5</sup> We note also that there exist verified successes in energy efficiency programs, as well as programs that seek to reduce industrial GHG emissions using IEE as the mitigation measure. (See for example the US DOE's Energy Efficiency and Renewable Energy Program [http://www1.eere.energy.gov/ba/pba/program\\_evaluation/plans\\_reports.html](http://www1.eere.energy.gov/ba/pba/program_evaluation/plans_reports.html) as well as the UK's DEFRA Climate Change Agreements <http://www.defra.gov.uk/environment/climatechange/uk/business/ccl/results.htm>)

## Shared vision

S.1 It is suggested that industrial energy efficiency be highlighted in particular as a part of the shared vision of the BRM; in that context the following are points are made for consideration.

### ***The imperative of Industrial Energy Efficiency***

S.2 According to global assessment scenarios, improved industrial energy efficiency (IEE) is one of the lowest cost GHG mitigation options available. Post Kyoto agreements (PKAs) and negotiations could do well therefore to help accelerate its large-scale uptake urgently.

S.3 Improved IEE has the benefit of reducing energy requirements per unit of industrial output. This can help reduce energy imports, improve energy security, and improve producer competitiveness. As such, IEE offers a mitigation opportunity that aligns with other national development goals<sup>6</sup>. PKAs could play an important role to help accelerate national development at the same time as reducing the carbon intensity of an economy. As an outreach to negotiators, clear indications of the full costs and benefits of existing (and effective) IEE programs should be documented and communicated to Member Countries. Not only does this underscore the synergy with broader development, but it also helps further promote the notion of an even more inclusive “shared vision”.

### ***Capacity building requirements<sup>7</sup>***

S.4 It is recommended that capacity building be a strong focus of future activities. Capacity building should include:

- a. Mechanisms and “tools” for country-specific policy assessments at the decision-maker level (see M.1);
- b. At the level of “practitioner”, data collection, industrial plant assessments/audits as well as monitoring, reporting and verification skills need building.

S.5 Based on national capacity to undertake the analysis, it was suggested that reporting an assessment of potential and existing IEE policies in national communications might be considered as a requirement. Furthermore, it was suggested that the development and adoption of indicators to measure the effects of IEE policy should be encouraged.

## Mitigation

M.1 A menu of existing (successful<sup>8</sup>) and potential IEE policies and measures (PAMs) should be compiled and documented<sup>9</sup>. Their attributes in terms of full costs and benefits must be catalogued or estimated. It should be noted that policies might be situation specific, varying by region and levels of development<sup>10</sup>. They may vary from PAM deployment to new technology development.

M.2 Based on specific IEE PAMs documented, it is suggested that an assessment should be made of their scalability, transferability (from one country/region to another) and their full costs (including institution and human capacity building, program costs, technology costs as well as other transaction costs). Such an assessment is necessary to relate technical mitigation scenarios with clear actions, or commitments. (Note that in this regard often-used marginal abatement cost curves can be misleading<sup>11</sup>). Furthermore, it was emphasised that allowing entities to adopt the most appropriate policies to suit their mitigation and development goals could be facilitated in future agreements. Clearly, all PAMs considered must include GHG mitigation measurement, reporting and verification as part of their activity.

<sup>6</sup> According to one study (Ehrhardt-Martinez & Laitner, 2008): In 2004, the U.S. invested an estimated \$300 billion in energy efficiency. This was about three times the amount invested in traditional energy infrastructure, whether power plants or oil and gas wells. Meanwhile, those investments in energy efficiency are estimated to have generated approximately 1800 PJ of energy savings in 2004 alone — roughly the equivalent of the energy required to operate 40 mid-sized coal-fired or nuclear power plants. Despite these important contributions to the nation’s energy productivity, the analysis points out that the contributions of energy efficiency have, in large part, remained invisible and often go unrecognized. Moreover, the report indicates that efficiency resources, although proven, remain seriously underdeveloped. In other words, substantial gains in efficiency are still available if we decide to pick up the pace of efficiency investments. References: Laitner, J. and Ehrhardt-Martinez, K., 2008. Information and Communication Technologies: The Power of Productivity; How ICT Sectors Are Transforming the Economy While Driving Gains in Energy Productivity. ACEEE Report E081. Washington, D.C.: American Council for an Energy-Efficient Economy.

<sup>7</sup> Please note, that although these are included under “shared vision”, they are equally applicable and submitted for consideration under “mitigation” considerations.

<sup>8</sup> At the same time, clearly documenting the failures of programs is needed to ensure reducing potential pitfalls as or when policies are replicated. Such an analysis should include an assessment of possible rebound effects and other key caveats.

<sup>9</sup> Specific PAMs highlighted during the meeting included as IEE Policies “that work” included, amongst others: (1) *Voluntary Energy Management Standards* with the aim of providing guidance for industrial facilities to integrate energy efficiency into their management practices. (2) *Mandatory Equipment Energy Performance Standards* that aim to eliminate obsolete technology from the marketplace. (3) *Industrial System Optimization* to achieve greater efficiency gains by considering the system, rather than its separate parts. (4) *Target-Setting Agreements* (voluntary or negotiated) between industries in specific sectors and governments to develop appropriate cooperative agreements for mitigation. (5) *Appropriate utility regulation and pricing* aiming to remove barriers from entry to the market. (Please note that this is simply a selection and a broader PAM assessment is required due to the specific nature of individual countries and their policy, capacity and technology contexts.)

<sup>10</sup> Developing countries – for example - often face different sets of objectives (e.g. increased energy access), barriers (e.g. non-cost reflective energy pricing), and opportunities (e.g. more SME related) and, therefore, different challenges and solutions.

<sup>11</sup> Marginal abatement cost curves for end-use efficiency technologies should be supplemented by estimates of the cost of delivery of the technology, which is often overlooked in analyses. Addressing market imperfections and barriers to the widespread uptake of high-efficiency equipment, systems and practices that promote energy conservation will require political will, cost money and take time.

In this regard, it was noted that the International Organization for Standardization (ISO), in cooperation with UNIDO, has initiated development of an energy management standard that includes requirements for measuring improvements in energy intensity against a baseline<sup>12</sup>.

M.3 It was also noted that measures such as energy auditing, monitoring and verification, equipment and minimum performance standards might be very generally applicable. As a common set of mitigation tools, future PKAs should focus the development environments that enable their adoption.

M.4 It was suggested that making progress and reporting on a set of IEE indicators, as means of encouraging and recognizing needed improvements in IEE, is an essential activity of PKA negotiations.

M.5 The CDM is a mechanism that could help stimulate GHG mitigation through greater energy efficiency in developing countries, but it has not delivered on demand-side EE thus far. It is important to understand the reasons for this failure and develop remedies (suggestions elaborated in section on Financing below).

Please see and include in this section S.4 and S.5.

### **Technology**

T.1 It was suggested that systematic identification of proprietary energy efficiency technologies and processes that have significant energy-savings potential could be institutionalised. That institution would further be tasked with exploring options to facilitate widespread deployment of these technologies in developing and transition economies.

T.2 It was suggested that IEE indicators might include aspects relating to efficient technology adoption<sup>13</sup>.

### **Financing**

F.1 It was noted that changes in end use technology have contributed significantly to energy consumption patterns, yet investment in energy efficiency technology development has been limited. It is important that increased investment of R&D of energy efficient end-use technologies be encouraged and facilitated.

F.2 Based on the mitigation assessment suggested in paragraph S.1 and M.1, a detailed assessment of financing requirements should be undertaken considering different scenarios of IEE policy and technology deployment. This should include the full costs alluded to, including: institution and human capacity building, program costs, technology costs, addressing market imperfections and barriers to the widespread uptake of relatively smaller and dispersed energy efficiency measures, as well as other transaction costs. This must be included in negotiations and could form a supplement to the UNFCCC 2007 report "Investment and Financial Flows to Address Climate Change".

F.3 Based on lessons learned from programs such as the UK's Climate Change Agreements (CCA<sup>14</sup>) as well as proposed mechanisms, methods to include carbon revenues in IEE programs should be considered. This is mentioned against the backdrop of low IEE uptake under CDM. It is however noted that methodologies under CDM are not static and new methodologies are evolving<sup>15</sup>.

F.4 Given the need to include risk in volatile markets and the historical inadequacy of representing IEE investment opportunities only in terms of their cost "payback", it is suggested that reporting also be made in terms of their risks and returns<sup>16</sup>. It should be noted that EE projects are not asset based but based on "savings" concept, which entails a high risk perception.

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<sup>12</sup> ISO 50001 - Energy management <http://www.iso.org/iso/pressrelease?refid=Ref1157>,

[http://www.unido.org/index.php?id=128&tx\\_ttnews%5btt\\_news%5d=220&tx\\_ttnews%5bbackPid%5d=6&cHash=1e43b97766](http://www.unido.org/index.php?id=128&tx_ttnews%5btt_news%5d=220&tx_ttnews%5bbackPid%5d=6&cHash=1e43b97766)

<sup>13</sup> This could be supported with survey methods and/or technology sales data.

<sup>14</sup> See: <http://www.defra.gov.uk/environment/climatechange/uk/business/crc/index.htm>

<sup>15</sup> Through the CDM, carbon finance could contribute to providing an additional revenue stream which could be targeted at the barriers and support the delivery of more energy efficiency programs, and thereby help reach - at least partially - the untapped energy efficiency potential. However, the CDM has disappointingly largely by-passed demand-side energy efficiency activities. It is critical to address this, but overcoming the barriers to end-use efficiency under the CDM was not included in the list of 26 possible CDM reforms in FCCC/KP/AWG/2008/L.12, despite widespread recognition of the problem Rules that recognize the specificity of energy efficiency activities and programs are needed.

<sup>16</sup> See for example, Jackson, J., 2008, Energy Budgets at Risk, Wiley ISBN: 978-0-470-19767-7