WFEO MEETING REPORT
UNITED NATIONS CSD-18

A. INTRODUCTION

The Commission on Sustainable Development (CSD) of the United Nations met in New York from 3rd to 14th May 2010 to start with its 2010-11 implementation cycle. This cycle, CSD-18 and 19, focuses on sustainable development progress in the following areas: sustainable consumption and production, transport, chemicals, waste management, and mining.

B. SCIENTIFIC AND TECHNOLOGICAL COMMUNITY

The scientific and technological community is represented by WFEO and ICSU (International Council for Science). Agreements with ICSU delegates, reached at CSD-14, allowed to voice the whole group's position through joint statements on the different issues of the Agenda, and to share in equal terms the time for interventions and the facilities assigned by the U.N. to the group.

C. PARTICIPATION OF THE WFEO DELEGATION

Appointed by the WFEO Executive Council, Messrs. Daniel Clinton (CCB Chair), Darrel Danyluk (CEE Chair), Rajeshwar Prasad Gupta (COMTECH Chair) and Jorge Spitalnik (CE Chair and WFEO Liaison with ECOSOC and UNCSD) represented WFEO in this Session. Also, representing Engineers Canada, David Lapp, and from AAES, Brid M. Moudgil, William O'Neill, Mike Sanio, Christopher Scarpino, Deborah Shield and Alan Taub attended as members of the WFEO delegation.

The position sustained by the WFEO delegation was to stress the technical nature of the issues discussed that required a serious observance of scientific principles and engineering criteria when searching for solutions of sustainability and development. This position was agreed and followed by our ICSU colleagues. Also, the need to analyze the engineering and technological feasibility of proposed solutions was emphasized by the WFEO delegation. In Annex 1, the interventions of the Science & Technology Group's representatives are included.

D. CSD-18 FINDINGS AND RECOMMENDATIONS

The 18th Session of CSD set up a series of policy options and practical measures for the decision making process on issues related to sustainable consumption and production, transport, chemicals, waste management, and mining. The complete text of CSD-18 findings and conclusions is available in document "Chairman's Summary Part I and Part II" on the UN webpage <http://www.un.org/esa/dsd/resources/res_pdfs/csd-18/Chairs_summary.pdf>.
Regarding CSD-18 issues specifically related to Science, Engineering and Technology, main findings and recommendations are described in the following sections.

FINDINGS

1. General

The need to address the gap between policy development and implementation, and the emphasis on the continued need for increased technology transfer and capacity building on the cluster issues were highlighted. Particularly, technology transfer without creating dependency and capacity building for developing countries and countries with economies in transition will require special attention.

Capacity building is essential to strengthen stakeholders' capacities to implement CSD decisions in the context of poverty eradication and sustainable development, including capacity to identify and mobilize existing and new resources.

The climate change adverse impacts on sustainable development, including through impacts on transport infrastructure, water availability and chemicals use was noted. It was stressed that progress in changing consumption and production patterns and transport mix and technologies, as well as reducing emissions from mining and mineral processing can all contribute to mitigating climate change.

The potential contribution of promoting innovative green technologies to sustainable development goals was emphasized. While a clear definition of a green economy has still to be determined, it was stated that a green economy will require partnerships and international cooperation to advance technology, sound investments and capacity building activities.

Greater technical and financial support is needed for small- and medium-scale enterprises, which often lack access to the latest clean technologies.

2. Sustainable production and consumption

Sustainable patterns of consumption and production are needed to reduce the material and energy intensity of economies and the generation of wastes. Implementing sustainable consumption and production (SCP) implies facilitating clean technology transfer from developed countries as well as strengthening local clean production capabilities.

Education, awareness raising and information sharing can support changes in consumers' behavior and thus function as a means towards more sustainable communities. Education for sustainable development is an investment in the future and this process needs to be supported and linked to other processes. Stronger involvement of research and science with evidence-based policy approaches is critical.

Capacity building could help develop a critical mass of professionals able to implement SCP activities. This could include targeted business-oriented educational programs on SCP. A program of capacity building, financial and technical support to small- and medium-scale enterprises in developing countries and countries with economies in transition could be considered.

Progress has been limited by the weak technical and institutional capacities in developing countries, and inadequate transfer and diffusion of technologies. To be able to scale up and replicate good practices, developing countries and countries with economies in transition will need transfer of appropriate technologies, increased Official Development Assistance (ODA) with new and additional resources, and capacity building. Countries should seek to leapfrog over obsolete technologies and practices towards efficient production and consumption and infrastructures that are of low maintenance.

3. Transport

Motorized transport depends on oil for its energy needs and contributes a growing share to global emissions of greenhouse gases. In many countries the number of private motor vehicles is expected to continue to grow considerably, but low investment levels for providing safe and clean fuels may pose a challenge.

Many countries are implementing or considering measures to reduce oil dependency and oil consumption in the transport sector as well as to improve fuel quality. These include lead elimination, reduction in sulfur, raising vehicle standards and reduction of the importation of second hand cars. Modern information technologies are also being used to reduce transport costs, fuel use and emissions. Some countries have developed water-borne transport as a low-cost and low-carbon alternative.

In the transport sector, Latin America and the Caribbean have had notable success with the development of bus rapid transit (BRT) systems and biofuels. The BRT model pioneered in some regional cities is being replicated in the region and beyond. The region has been a leader in the production and use of alternative transport fuels.

The contribution of biofuels and flex-fuel cars to sustainable development in some countries was noted, including the need to address the related challenges and opportunities.

Technology transfer and capacity building are urgently needed to make transport systems in developing countries more sustainable. Significant examples of South-South co-operation were given, including for bus rapid transit (BRT), sustainable biofuels, water management, and small-scale renewable energy. Partnership for Cleaner Fuels and Vehicles, the Bio-Energy Partnership, and the Asia-Europe SWITCH Partnership, EU-AU collaboration were cited, including on agriculture and food security.

Bonus-malus (discount-premium) incentive systems have proven successful to improve car fuel efficiency.

4. Chemicals

Gaps in sound management of chemicals exist throughout the life cycle and in both the public and private sectors. They include: insufficient and unavailable information and data on chemical safety and toxicity, especially in national and local languages; lack of awareness of the potential risks that chemicals pose and their environmental liabilities, and insufficient human and technical capacity for risk assessment.

Practical measures at the international level could include establishment of an international mechanism to support education and capacity building in the implementation of the three Conventions (Rotterdam, Stockholm and Basel); improving dissemination and exchange of information on chemical safety matters, including the potentially hazardous chemicals in products; implementing the Globally Harmonized System of Classification and Labeling of Chemicals; developing a global legally binding instrument on mercury; establishing a global system for communicating risk and hazards; and addressing emerging issues such as nanomaterials and e-waste.

In certain regions, the lack of updated information and access to technologies, inadequate capacities, insufficient enforcement of regulations, and weak regional coordination remain major impediments to sustainable chemicals management. The need for safe management and handling of chemicals was noted especially in Africa where greater access to chemicals for agriculture and the process of industrialization is essential. Local governments often face a lack of capacity and financing, in particular with regard to electronic waste. Regional Centers under the three chemical conventions have played an important role in capacity building and technology transfer.

The Strategic Approach to International Chemicals Management (SAICM) constitutes an important global framework for strengthening capacity for sound chemicals management and narrowing the capacity gap between the developing and the developed countries.

Calls were made for participation of the private sector and other stakeholders such as civil society, academia and scientific societies in financing sound chemicals management.

5. Waste management

Local authorities' capacity in the area of waste management could be strengthened.

Capacity building is also required for all relevant stakeholders, including for local policymakers in developing countries and for advanced research.

In North-South cooperation, there is a need for clean technology transfer, e.g., related to solid waste management.

6. Mining

Mining is a critical resource for most countries. Challenges include infrastructure improvement, capacity building and review of existing legislation. The demand for minerals in some regions has substantially increased, including the demand for rare metals, and rare earth elements needed for the production of clean technologies.

Some countries lacking financial and technological capacity for mineral extraction may agree to skewed mineral development contracts. Technical capacities of national institutions dealing with mining should be strengthened, notably in developing countries and countries with economies in transition. Actions include investing more in research and scientific capacity and upgrading technical education and training. Technical and managerial training for the mining sector need to include sustainable development content.

Sound and sustainable management of the mining sector requires transparency, which can be enhanced through partnerships, monitoring of mining through a life-cycle assessment approach, and development of new and clean technologies.

Capacity building to enhance developing countries' management of mineral revenues, including at the level of local authorities and communities, would help ensure that those revenues serve a positive role for development. There is a need for strengthening the capacities of local and national governments for safe management and disposal of waste accumulation, in particular from the mining sector. Capacity building can be furthered through regional and inter-regional exchange of experiences; identification and dissemination of best practices and creation of an appropriate knowledge base on mineral resources and mining for strategic planning and policy innovation, as well as on managing mining environmental and social impacts.

RECOMMENDATIONS

1. General

Continued investments in capacity building, human resource development, transfer of technology, and research and development, including through international cooperation, are necessary for achieving the 2020 goal.

Multi-stakeholder partnerships in particular need to play an increasingly important role in helping to meet developing country needs for funding, research capacity, service delivery and technological innovation.

While major efforts were made by Small Island Developing States (SIDS) to build resilience, an implementation gap persists, which needs to be addressed through resources, capacity building, access to financing and technology.

2. Sustainable production and consumption

There is a unique opportunity to envision improved collaboration and cooperation and find common ground in the areas of policy coherence, strengthened institutional and legal frameworks, and application of scientific and technological innovations.

It is important to provide incentives and to support countries and actors in using a diverse set of tools and approaches that have proven their usefulness in advancing SCP, including: sustainable procurement, cleaner production guidelines and methods, green building codes and standards, sustainable resource use measures, demand-side management for electricity, reduction of fossil fuel subsidies, promotion of renewable energy through feed-in tariffs, development of super-efficient consumer products, eco-labeling, codes of conduct for advertising, awareness raising campaigns and education for sustainable consumption and lifestyles.

A 10 Year Framework of Programmes (10YFP) must address the gaps and challenges faced by developing countries related to SCP, namely predictable financing for implementing SCP activities, training and capacity building and transfer of clean technologies. The 10YFP should be embedded in the broader UN system and rely on sound science and engineering, including the UN International Panel on Resource Efficiency.

3. Transport

De-coupling of transport services and energy use is important to mitigate climate change and improve efficiency. Further development, research and deployment of advanced transport technologies will be essential to achieve a sustainable low-carbon transport future. This includes battery technology development for electric vehicles as well as hybrid and flex fuel cars. International collaborative research is to be encouraged.

In light of recent volatility in international energy prices, the development of alternative fuels, including compressed natural gas, ethanol and bio-diesel, can offer diversification of transport fuels as part of an array of options for sustainable transport.

National measures to reduce pollution from the transport sector also include improving fuel and motor vehicle emission standards.

Technology development, technology transfer, knowledge and experience sharing and capacity building need to be enhanced to make transport systems in developing countries more sustainable.

4. Chemicals

At the national level, priority areas for action include strengthening national legislation, with international cooperation and training on enforcement and compliance; integrating chemical management into national development priorities and budgets; establishing mechanisms for inter-sectoral cooperation in all countries; enhancing capacity for chemical risk assessment, including both human capacities and laboratory facilities; developing alternative products and technologies for replacing the most hazardous chemicals.

5. Waste management

There is a need for consolidation of existing infrastructure for hazardous waste disposal as well as new infrastructure development in this area.

6. Mining

More sustainable mining operations require: strong, transparent and ethical governance; adequate laws and regulations; trained government officials that can enforce laws and regulations; clear sharing rules for revenues; and legal systems offering recourse to communities adversely affected by mining activities.

As many developing countries lack institutional and technological capacity, technology transfer from developed to developing countries and capacity building could consider: strengthening technical capacities of national institutions dealing with mining; reinforcing capacities at the national and local level for establishing contracts with companies, managing contracts, managing revenues from mining, and organizing participatory processes.

There is a need to implement actions supporting countries to undertake geological surveys and gather mining data; invest more in research and scientific capacity and promote capacity building in science and technology, as well as to upgrade mining education and training, for example through technical education and training organized jointly by developing countries and developed countries including sustainable development content; and promote the exchange of knowledge, practices in scientific research, environmental practices, and post-mining good practices.

E. WFEO SIDE EVENT

On May 4, 2010 WFEO held a side event at the UN Headquarters entitled Capacity Building: Words into Action 2010 on Transport Efficiency and Waste Avoidance – Input for Policy-Makers. This event was organized by the WFEO Standing Committees on Engineering and Environment (CEE), Capacity Building (CCB) and Energy (CE) who took care of all related costs. After having ICSU accepted the WFEO invitation to co-sponsor the event, it became a joint Scientific & Technological Communities Major Group sponsored meeting. Invited speakers were: Alan Taub (U.S.) contributing with a presentation on "The Reinvention of the Automobile: Driving to a Sustainable Future"; Mahash Patankar (India) on "Adopting Alternate Fuels in Transport – From Policy to Implementation", and William O'Neill Jr. (U.S.) on "Sustainable Global Fertilizer Transportation". Darrel Danyluk (WFEO) chaired the event and David Lapp (Engineers Canada) acted as the rapporteur of the meeting. These presentations will be available on the WFEO-CEE webpage <http://www.wfeo.org/index.php?page=cee>. Annex 3 shows the event invitation announcements and Annex 4 summarizes its outcome. This event was an excellent means to show the contribution of WFEO expertise on matters related to CSD issues and, in this particular case, it helped to enhance WFEO prestige among participants of other Major Groups and of the CSD Secretariat. The interest showed by those who attended the meeting encouraged the WFEO delegation to consider organizing future events of this type focused on new engineering advances and technological innovations.

F. NEXT CSD SESSION

Next CSD-19 meeting, in 2011, will discuss the findings and recommendations of CSD-18 on sustainable consumption and production, transport, chemicals, waste management, and mining. As with CSD-18, Engineering will have a leading role in preparing position statements within the Scientific & Technological Community Major Group. WFEO members' involvement is expected to be quite significant in the preparation and decision making negotiations of CSD-19.

4th June 2010

Jorge Spitalnik
Chair, WFEO Energy Committee
WFEO Liaison with UNCSD

Annex 1

CSD-18 - STATEMENTS BY WFEO AND ICSU DELEGATES

Opening Statement
May 3rd 2010

Thank you Mr. Chair to giving the floor to the Scientific & Technological Communities.

Progress in meeting sustainable development goals in the areas under review at this CSD session will require substantial innovative advances in science and technology.

There is clear evidence that human actions have become the main driver of global environmental change and that, in certain parts of the world, the current aggregate trends and patterns of consumption and production are unsustainable. This is particularly true with regards to current transportation technologies, management of chemicals and waste, and mining practices. On the other hand, solutions already exist that are in line with sustainable consumption and production.

The advancement, sharing and application of knowledge, science, engineering and technology must be central to efforts of addressing the sustainable development challenges on the agenda of CSD-18. The search of solutions to the issues that will arise in this cycle of discussions should be based on sound science and engineering in order to deliver realistic policies.

Jorge Spitalnik, WFEO

Regional Discussions – Asia & Pacific
May 3rd 2010

Chemical and waste management

- Energy security and integration of renewable energy sources in the production processes is essential ~ international efforts related to promoting RE and related south-south collaboration in its adaptation is important.
- Electrical demand-side management techniques and cogeneration opportunities through industrial ecology concepts in the chemical industrial sector have helped reduce energy use ~ specific technology development and capacity building among SMEs in such technologies would be useful.

Transport

- Transport and air-quality issues are inevitably interlinked ~ so regional dialog on such issues would be useful.
- Rapid growth towards alternative fuels and inter-modality in transport network are evident, especially the Bus Rapid Transit, Metro rails and high-efficiency vehicles ~ capacity building of the operators for example becomes important then.
- Adoption of newer technologies such as electrical/hybrid vehicles need to be brought in sooner ~ targeted research and development in this sector should be promoted

Mahesh Patankar, ICSU

Regional discussions Latin America and the Caribbean
May 3rd 2010

Viewpoint of the Scientific & Technological Communities on Biofuels production in Latin America

Programs for producing ethanol and bio-diesel are already in place based on different crops. Biomass production for fuels requires land resources and, in many parts of the world, may have to compete with food production. Moreover, the water footprint of biofuels is a challenge that should not be ignored. Some tropical countries and this applies to Latin America have large tracts of degraded lands that could benefit from the establishment of bio-energy plantations. Planting arid, semi-arid, degraded, and marginal lands that are unsuitable for food production, with non-edible bio-fuels crops would not compete directly with current food production and could help rehabilitate the soil. For large agricultural areas, on a case-by-case basis, a scientific, engineering, social, economic and sustainability analysis should be conducted on the comparative advantage of planting food or biofuel crops, especially in the face of the ongoing global food crisis.

A shift towards cellulose-based second generation biofuels using wood and grassy crops would offer greater reductions in carbon dioxide emissions and less land used per unit of energy. However, technical breakthroughs would be required to achieve this.

Jorge Spitalnik, WFEO

Transport Panel
May 4th 2010

We would like to comment and support three topics related to the transport sector:

i. Need for a sound scientific planning approach;
ii. Need for promoting multi-modal and multi-fuel transport mix; and
iii. Socio-technical research agenda supporting the transport sector.

I will now elaborate on the three points.

1. We see an opportunity to develop a sound scientific planning approach:

   Transport planning seems to be playing a catching-up game related to providing sustainable solutions. As indicated by the UN Habitat, by 2050, 2/3rds of the world population would live in urban environment. In several countries, the urban boundaries are expanding as peri-urban areas, which would subsequently evolve as new cities. It is thus important to develop a sound scientific modeling approach in designing integrated and inter-modal transport network. Such an approach as a policy-goal would be useful in creating sustainability of the sector.

2. Multi-modal, multi-fuel transport planning would be a useful tool:

   Policy dialog could also focus on using all transport modes innovatively rather than creating unwarranted competition among the transport modes and different fuel used. Examples from Singapore, Hong Kong, London and New York for example are role models that could be followed while designing Official Development Assistance.

3. There is a need to develop understanding of socio-technical features of transport:

   Global research network focusing on socio-technical features of future sustainable transport system as well as the technology development through involvement of the scientific community can add value to the policy-implementation process.

Mahesh Patankar, ICSU

Thematic discussions - Mining
May 5th, 2010

Thank you Mr. Chairman for giving the floor to the Scientific & Technological Communities.

Mining, the primary production of metallic and non-metallic minerals, has an important role to play in sustainable development, as a source of essential raw materials, and as an engine of economic development and wealth creation. Minerals and metals are essential to every sector of every nation's economy and will play a determining role in the feasibility of the emerging technologies that sustainability will require. Thus, mining is inextricably linked to the other four thematic areas being addressed during CSD 18. For example, progress toward meeting sustainable development goals in the area of transport will require infrastructure built of aggregates, cement, and various metals. Minerals are also integral to sustainability in other areas, such as the MDG of food security, which will require fertilizers made of nitrogen, phosphorus, and potash.

We recognize that no single ore deposit or mine is sustainable. However, the ability of the minerals industry to make positive contributions to society, and to set the stage for empowering sustainable communities, increasingly depends on the sector's willingness to adopt sustainable mining practices. Many of these practices are in turn based on sound science and the application of appropriate technology. For mining technologies of the present and future to be compatible with sustainable development, they must be economically feasible, contribute to positive community development, fairly share risks and benefits within and across generations, and have low environmental footprints. Specific attention to the entire life cycle of a mine, from exploration, to project development, operations, closure and post-closure must become the frame of reference for any assessment of a mine project's contributions to sustainable development.

Specific examples of engineering-based technical improvements realized in mining over the past decade (and for which wider implementation is required) include:

- Reduction of the water footprints of mining and minerals processing (e.g., increased water recycling) and the use of environmentally benign dust-suppression chemicals that reduce road-watering intensity;
- Waste-heat recovery and co-generation projects resulting in significant efficiencies and reduction in carbon emissions;
- Use of renewable energy (such as solar, wind, geothermal) on mine-sites;
- Use of robotics, particularly in sub-surface environments that may pose unacceptable risk to human life such as excessive temperatures at depth or radioactivity;
- Re-processing of mineral wastes to recover lower grade remnants left behind by previous generations, as well as the rare earth elements essential for green technologies; and
- Proper management of waste stockpiles, including accounting for segregation of material types for leaching and/or future aggregate potential.

The Scientific and Technological Communities recognize that the advancement, sharing and application of knowledge, science, engineering and technology must be central to efforts of addressing the sustainable development challenges associated with mining. Mining, mineral processing and metallurgical engineers, and those in each of the supporting earth science fields, who have been trained in the principles of sustainability will be needed to implement scientific and engineering advances in the field. Supporting education and research in these fields will be essential and must be expanded, particularly in developing nations.

Deborah Shields, WFEO

Thematic discussions - Sustainable Production and Consumption
May 7th 2010

Thank you Mr. Chairman for giving the floor to the Scientific & Technological Community.

Science, engineering and technology will be critically important for moving to sustainable consumption and production patterns. Our comments today are focused on specific aspects of sustainable production systems and also aspects of sustainable waste management.

Enhancing energy conservation and efficiency, sustainable industrial and chemical production, sustainable buildings and construction, sustainable physical infrastructure are key areas for decoupling economic growth from environmental impact. For moving in this direction, it will be important to disseminate among all production and consumption sectors two main concepts: 1. knowledge of product life cycle, and 2. true cost of a product that includes the recycling costs.

The Scientific and Technological Communities recognize the importance of recycling and the potential of recycled materials to supplement the flow of primary materials to production processes. We wish to comment on the importance of life cycle assessments of the consumption cycle, and specifically recycling processes. It is essential to develop data and information on the energy and material inputs and outputs associated with the recycling of various products, as well as the social and environmental impacts of recycling activities. If data and information are lacking, it is often not possible to identify those instances where recycled materials are more sustainable than those supplied from primary sources.

The engineering of recycling is far from complete. Continuing scientific and engineering advancements are needed to ensure that recycling of the full range of materials, including advanced composites, will be possible, which is not the case today.

We wish to express our support for the UNIDO-UNEP Cleaner Production Initiatives and note the importance of National Cleaner Production Centres in facilitating the transfer of engineering advancements to, and the implementation of cleaner technologies and industries in developing and transition countries. This successful capacity building program deserves the support of Member Nations and Major Groups.

In conclusion, the Scientific and Technological Community fully supports the development of a 10 Year Framework of Programmes on Sustainable Consumption and Production. All domains of science, engineering and technology are committed to contribute to this important initiative. The contribution of the social and economic sciences will also be important in this respect.

Deborah Shields / Darrel Danyluk, WFEO

Multi-stakeholder Dialogue on Partnerships for Sustainable Development
May 11th 2010

It was a pleasure to listen to the panelists this morning, presenting very interesting examples of partnerships. We noted that in practically all of them the scientific, engineering and technology communities were among the partners and we stand ready to enhance our involvement.

The Scientific and Technological Community major group also very much welcomes calls made by a number of governments and regional groups during last week's discussions –unfortunately only partly included in the Chair's Summary - to strengthen partnerships involving our major group of scientists, engineers and technology experts. These calls related to developing jointly innovation and R&D strategies at all levels for the CSD-18 topical areas, as well as partnerships on scientific and technological capacity building, the development of new environmentally sound technologies, and the transfer of such technologies, where appropriate, including South-South cooperation.

Research partnerships and information exchanges on chemical risks, waste management, and transforming the transport and mining sectors are vital for overcoming major obstacles to sustainable development in these CSD-18 topical areas.

A 10-Year-Programme on Sustainable Consumption and Production will have to be built on a wide range of partnerships, and the involvement of the Scientific and Technological Community, including the social and economic sciences, will be essential.

There exist many examples of ongoing partnership initiatives with our communities either in the lead or as a major partner. Earlier this morning, we heard from Mr. Mauricio Fernandes about the successful International Year of Planet Earth in 2009 which represented a partnership between the earth sciences community, UN organizations, governments, private sector and civil society organizations. Next year 2011, coinciding with CSD-19, will be the International Year of Chemistry, lead by the International Union of Chemistry and UNESCO, which will strive to build an equally large partnership as for the IYPE.

Enhancing knowledge through sound research, and technology through sound engineering, will be pivotal for achieving sound policies and technological innovation. We are involved with relevant UN system organizations in

worldwide scientific research and assessment partnerships on several major global environmental change issues, such as climate change and biodiversity loss. With WMO and many governments, we are currently involved in the development of a Global Framework of Climate Information Services.

Finally, I wish to refer to our strong partnership links with most of our Major Groups partners. The Farming First partnership involving the Farmers, Business and Industry and Scientific and Technological Community major groups is an excellent example in this regard.

Gisbert Glaser, ICSU

Multi-stakeholder Dialogue on Advancing the Implementation of CSD Decisions
May 11th 2010

Mr. Chairman,

Progress in meeting sustainable development goals in the areas under review at the CSD-18 session will require substantial innovative advances in science and technology. Enhanced North-South and South-South scientific and technological cooperation, knowledge networking and dissemination, and engineering know-how and technology sharing will be essential. To this end, our community seeks to enhance further its cooperation with all stakeholders, including governments, business and industry, farmers and all other major groups.

It is also important, Mr. Chairman, to weigh the feasibility of proposed solutions considering existing knowledge and technological state of the art.

There is clear evidence that human actions have become the main driver of global environmental change and that the current aggregate trends and patterns of consumption and production are unsustainable. In the view of our community, decoupling of energy and natural resources consumption from economic growth has become a great urgency.

Transportation technologies are progressing on many fronts towards lower emissions of air pollutants and greenhouse gases. Despite this, there remains a strong need to reduce demand for personal vehicle transport and long-distance road transport of goods. The continued market penetration of technological innovation needs to be encouraged through economic incentive programmes, and research, development, and deployment efforts. Policies aimed at diversifying mobility means and public transport in urban zones must also accompany the technological advances.

Sound management of chemicals is required throughout their life cycles. The S & T Community strongly supports the implementation of the Globally Harmonized System of Classification and Labeling of Chemicals. Chemicals industries need to adapt their technologies to carbon-footprint reduction for all material and processes. Among the challenges faced by developing countries are the lack of adequate human resources and institutional capacities for risk assessment and interpretation, for implementation and enforcement of regulatory frameworks, and for rehabilitation of contaminated sites and emergency response.

In the area of waste management, developing countries face very similar problems. We support the 3R approach to waste management of reduction and prevention of waste; maximization of reuse and recycling. Another need is the replacement of products with harmful waste by environmentally friendly alternative materials. More studies on best practices and enhanced information sharing will be crucial.

The large physical footprint of surface mines should be planned to reduce environmental impacts during mining and return the land to a sustainable post-mining use. Safety guidelines and good practices for tailings management should be developed. It is fundamental that social impact assessments are done, in consultation with the local communities, before the extractive activities start. Countries should ensure that adequate environmental monitoring systems are put in place.

Implementation of these sustainability policies will require professionals with a solid training and knowledge in different fields of science, engineering and technology; as well as strong and focused national, regional and global science, engineering and technology institutional capacities.

Jorge Spitalnik, WFEO

Roundtable Meeting on the Challenges of Transportation Needs in the 21st Century
May 13th 2010

The Scientific and Technological Community recognizes that for many countries, in particular developing countries, the expansion of transportation, and in particular of transport infrastructure, is an important necessity, not the least for providing farmers access to markets. However, an increasing decoupling of this expansion of transport from fossil fuel consumption must be achieved.

New transportation technologies are progressing on many fronts towards lower emissions of air pollutants and greenhouse gases. Nevertheless, even with the aggressive implementation of cleaner vehicle technologies, in developed and emerging countries there remains a strong need to reduce demand for personal vehicle transport and long-distance road transport of goods.

Technological innovations are gaining commercial success in differing rates. Their continued market penetration needs to be encouraged through appropriate economic incentive programmes, as well as enhanced targeted research, engineering, and deployment efforts. Actions for promoting cleaner fuels and vehicles, including hybrid and electric cars, must also be complemented by policies to diversify mobility means, to introduce efficient and sustainable public transport, in particular in urban zones, and to enhance public space management in cities with new modes instead of car usage. In many developing countries, training of scientists and engineers in transport related disciplines, as well as institutional capacity building must be fostered.

Introducing biomass production for fuels should be based on sound studies which have to evaluate risks of competition with food production and potential effects on crop prices.

Quite often urban transport planning seems to be playing a catching-up game related to providing sustainable solutions. By 2050, 2/3rds of the world population will live in urban areas. In many countries, the urban boundaries are expanding as peri-urban areas, which over time will evolve in new cities. It is thus important to develop now a sound scientific modeling approach in designing an integrated and inter-modal transport network, including a feasibility analysis. Making such an approach part of CSD policy recommendations and working with the Local Authorities would be useful for creating sustainability of the sector.

Policy dialogue at the national and local level should also focus on using all transport modes innovatively rather than creating unwarranted competition among the transport modes and different fuel used. Singapore, Hong Kong, London and New York are role models in this regard that could be followed where appropriate. In general, the transport sector lends itself to enhanced South-South cooperation, in particular as regards sharing of scientific knowledge, best practices and engineering solutions.

This brings me to my last point. The scientific, engineering and technological communities can play a key role in understanding the policy-implementation nexus, what has worked and what not. For instance, a number of well researched examples the world over of alternative fuel policies and the problems they faced in implementation can provide important information to be taken into account by those countries which are in the process of developing new policies in this domain. Such interdisciplinary socio-technical research should be strengthened.

Gisbert Glazer, ICSU

Roundtable Meeting on Waste Management
May 12th 2010

In several parts of the world there is a legacy of accumulation of hazardous wastes. Large stockpiles of obsolete pesticides exist containing persistent organic pollutants and large amounts of industrial waste, mainly from resource mining and processing activities. Thus, management of hazardous wastes will require special care on a global basis.

The developing international trade in electronic waste has become an issue of concern, as large quantities of e-waste are being exported to developing countries for re-use, repair, and recycling as well as for recovery of non-ferrous and precious metals. Moreover, plastics in the marine environment have become a major problem for plastics release toxic chemicals into the ocean.

A lot of waste is generated when existing infrastructures like roads, buildings, and other facilities are replaced. This can be averted or minimized by recycling or finding new uses for the material. The LEED (Leadership in

Energy and Environmental Design) approach to building design, engineering and construction has gained increasing acceptance in recent years. LEED not only encourages capture, conservation and recycling of grey water, it also promotes life-cycle approach that considers the end of the building useful life.

Regarding energy wasted at low temperatures, co-generation is to be encouraged for allowing taking advantage of unused heat from the residential, commercial and industrial sectors power usage. Energy efficiency measures in the industrial sector also have co-benefits due to reduction in fuel and material use, leading to reduced emissions of air pollutants, solid wastes and waste water.

Jorge Spitalnik, WFEO

Interactive Ministerial Dialogue Way Forward Meeting
May 14th 2010

In the view of the Scientific and Technological Community, these two weeks of CSD-18 have shown that one of the priorities to be addressed in CSD-19 are science and technology related to Education, Training, and Institutional Capacity Building.

Mainstreaming "sustainability" in the transport, chemicals, waste disposal and mining sectors requires professionals with a solid training and knowledge in different fields of science, engineering and technology. Addressing the challenges of sustainable development in these sectors, as well as in the overarching field of sustainable consumption and production requires strong and focused national, regional and global science, engineering and technology systems. However, it is now clearer than ever that these challenges have thus far outstripped the capacities both of the science and technology community and of society to forge effective and comprehensive responses. Nothing less than a massive effort will be needed in order to strengthen scientific and technological capacity in all regions of the world, and in particular in developing countries.

The still widening North – South divide in scientific and technological capacity must be bridged. The countries of the Organization for Economic Cooperation and Development spend annually more on research and development than the economic output of the world's 61 least developed countries. Developing countries must address this problem and significantly enhance investment in higher education and scientific and technological capacity.

Enhanced knowledge sharing, innovation through sound engineering and technology transfer efforts, including South-South cooperation, will also be needed.

Jorge Spitalnik, WFEO

Closing Session
May 14th 2010

Mr. Chairman, in this final statement, the Scientific and Technological Community acknowledges your leadership and that of the Bureau and we acknowledge also the strong support expressed in this CSD-18 session by governments and Major Groups, notably Farmers and Business and Industry, for a better harnessing of science, engineering and technology in addressing sustainable development challenges in the areas under review.

While the application of existing know-how and technology which meet sustainable development criteria is often providing appropriate solutions, the way forward will also require substantial innovative advances in science, engineering and technology, and in this regard a very significant enhancement of public and private investments in research, science and technology. Public-private partnerships will be one important means in moving to implementation.

A related priority for the CSD-19 policy session should be policies aimed at enhancing education, training and institutional capacity building in science, engineering and various domains of technology with focus on the areas of sustainable consumption and production, transport, mining; waste and chemicals.

While a major responsibility for this lies with each national government, the global development assistance community and the international S&T community should enhance support to and collaboration and partnerships with developing countries.

In conclusion, Mr. Chairman, our community is looking forward to work with you and all stakeholders beyond CSD-18.

Gisbert Glaser, ICSU

Annex 2

EVENT INVITATION

Scientific and Technological Major Group
Capacity Building – Words Into Action 2010
"Transport Efficiency and Waste Avoidance – Input for Policy-Makers"
A Side Event at UN-CSD-18. Conference Room 6. New York, New York
Tuesday May 4, 2010 - 1:15 to 2:45 p.m.

Abstract

Efficient and effective infrastructures are fundamental to sustainability. The three pillars of infrastructure are physical infrastructure, social infrastructure, and economic infrastructure. Experts from the World Federation of Engineering Organizations, ICSU, and from AAES IntAC/AIME will contribute by presenting on the inter-linkages between transport infrastructure and social and economic infrastructures identifying opportunities to reduce/reuse waste.

Presentations will be followed by a group session where participants discuss the needs and opportunities; identify barriers to actions; and brainstorm solutions for action.

An output document will be prepared and delivered electronically to registered participants. This document will include copies of the presentations.

Educational Objectives

Upon attendance at this event, participants should have:

- Greater awareness of the importance of modes of transport and their infrastructures in addressing losses during transport
- Identification of opportunities to improve transport to reduce losses
- Increased understanding of physical, economic and social infrastructures

Agenda

1:15 **Welcome and Introductory Remarks**
D. (Darrel) Danyluk, P.Eng. (Canada)
Vice-President - World Federation of Engineering Organizations (WFEO)
Chair – WFEO Committee on Engineering and the Environment

1:20 **The Reinvention of the Automobile: Driving to a Sustainable Future**
A. (Alan) Taub (United States)
Vice-President, Global Research and Development
General Motors

1:40 **Adopting Alternate Fuels in Transport – From Policy to Implementation**
M. (Mahash) Patankar (India)
International Council of Scientific Unions

2:00 **Sustainable Global Fertilizer Transportation**
William (Tip) O'Neill Jr., (United States)
President, International Raw Materials Inc.

2:20 **Questions and Facilitated Discussion**

2:40 **Closing Remarks**
D. Danyluk, P.Eng.
Vice-President World Federation of Engineering Organizations

Annex 4

EVENT SUMMARY REPORT
David Lapp, Engineers Canada

WORLD FEDERATION OF ENGINEERING ORGANIZATIONS

- Committee on Capacity Building
- Committee on Energy
- Committee on Engineering and Environment

ICSU International Council for Science

May 4, 2010 UN-CSD 18 Side Event
Organized by the Scientific and Technological Major Group
Title: Capacity Building: Words Into Action 2010
Transport Efficiency and Waste Avoidance – Input for Policy-Makers

Introduction

This 90 minute event, which was jointly organized by the World Federation of Engineering Organizations and the International Council of Scientific Unions (acronym ICSU), consisted of three excellent presentations from three prominent speakers, followed by questions and answers and finally with a general discussion. There were 30 participants from 11 countries and included government officials as well as representatives from non-government organizations, either at national or international levels. A partial list of attendees is provided in Appendix A.

The workshop was facilitated by Mr. Darrel Danyluk, P.Eng., who chairs the Committee on Engineering and the Environment within the World Federation of Engineering Organizations, one of four committees that support the World Federation of Engineering Organizations involvement in the UN-CSD process through the Scientific and Technological Major Group.

The focus of two of the presentations was on recent and upcoming developments and trends in motor transport, a key technology for public transport and the transport of people and materials. The third presentation focused on trends and developments in the transport and use of agricultural fertilizers, a key technology for increasing and optimizing agricultural food production. Copies of these presentations will be available as electronic files in pdf format (by permission of the presenters). The three presenters and their organizations were:

Mr. Alan Taub - Vice-President of Global Research and Development, General Motors;

Mr. Mahash Patankar – International Council of Scientific Unions;

Mr. William Tip O'Neill - President, International Raw Materials Inc.

The organizers wish to thank the presenters for making these available. The objective of the side event was to contribute to the current agenda of CSD-18 by presenting some of the transportation technologies and trends in sustainable transport in the context of sustainable development and the reduction of waste.

This event is part of a continuing strategy of the Scientific and Technological Major Group to build awareness and understanding of current CSD themes from a scientific, engineering and technology perspective. The Scientific and Technological Major Group intends to continue these workshops and interventions on the subject agendas of the CSD at the international and where feasible, regional meetings.

In the context of this work, WFEO defines capacity building as:

"The building of human, institutional and infrastructure capacity to help societies develop secure, stable and sustainable economies, governments and other institutions through mentoring, training, education, physical projects, the infusion of financial and other resources, and most importantly, the motivation and inspiration of people to improve their lives."

The educational objectives of the event were:

- Greater awareness of the importance of modes of transport and their infrastructures in addressing losses during transport;
- Identification of opportunities to improve transport to reduce losses Increased understanding of physical, economic and social infrastructures.

Summary of Presentations

Alan Taub – Vice-President, Research and Development – General Motors

The Reinvention of the Automobile: Driving to a Sustainable Future

The major points of this presentation were as follows:

- More than 1 billion people will own cars before 2020 and the way cars are built and supplied today will not work for this projection;
- The challenges for the manufacture of cars now and going forward include energy sourcing and availability, reducing emissions to "no tailpipe environmental impact, and, increasing the safety of vehicles to reduce deaths;
- The world continues to urbanize which presents two additional challenges – congestion and affordability;
- Vehicles typically use only 5% of the BTUs for propulsion – 50-65% of BTUs are lost by the internal combustion process – much room for improvement;
- The hybrid process in use today is an intermediate state towards fully electric vehicles where energy is stored in batteries or use fuel cells to convert to hydrogen energy;
- General Motors is working on an individualized urban transport vehicle referred to as En-V that is totally electric;
- Impact of electric vehicles on electricity grid is projected to be less than 1% of the total capacity – also could charge at night when there is less load on the grid and excess capacity.

Mahash Patankar – International Council of Science

Adopting Alternate Fuels in Transport – From Policy to Implementation

The major points of this presentation were as follows:

- This presentation focused on the end-to-end process (policy to implementation) of transiting vehicles to alternate fuels, using a case study of converting public transport vehicles from gasoline to compressed natural gas in two Indian cities (Mumbai and New Delhi) with 100% compliance in less than four years;
- The adoption of the policy framework to achieve the goal, which is in this case means switching to alternate fuels, requires setting the policy (Stage 1) which enables but by itself is not sufficient followed by a use stage (Stage 2) both of which provide a sufficient condition for implementation;
- The sufficiency conditions for implementation include the users decision to change e.g. use alternate fuel as well as the need for ancillary infrastructure and greater availability of improved technology ;
- For public transport vehicle conversion to CNG was driven by the recognition of deteriorating air quality, advocacy by non-government organizations and key rulings in the court system;
- The implementation challenges included the availability of CNG infrastructure, the appropriate diesel-fuel engine technologies, testing procedures and infrastructure;
- The biggest issues for users were socio-economic and particularly the hit on net monthly income of the public service and workers;
- The lessons learned through this example include setting policy goals early with firm timelines for response and the process, ways to ensure compliance with the policy framework, availability of infrastructure and proper stakeholder consultation;
- There is a need to foster and promote technology development as well as capacity building and training of people to service these vehicles and to develop a market for these services through enterprise development;
- For implementation focusing on technology development, transfer and adaptation processes for users and other stakeholders is important as well as local retrofitting and development of sufficient maintenance capacity (facilities and service);
- The results of this case study are presently being used to adapt public transit vehicles to CNG in six other Indian cities. For the most part, it is believed that this approach could be adapted in other countries.

William Tip O'Neill, President – International Raw Materials Inc.

Sustainable Global Fertilizer Transportation

The major points of this presentation were as follows:

- One of the UN Millennium Development Goals (MDGs) is to eradicate extreme poverty and hunger – agricultural production is a key strategy for poverty reduction;
- Over 1 billion people out of our current population of 6.8 billon is undernourished – and our population is projected to grow to 9 billion by 2050;
- Example – China has 20% of the world's population, but only 9.1% of its arable land – need for higher production which involves fertilizers;
- It requires thousands of miles of transport to move nutrients (fertilizers) to farms for production, then we have to move production to the consumers through transport;
- Over 180 million tons of fertilizer are shipped worldwide through multi-modal transport (ship, rail and vehicles) – the presentation included a graphic of the relative movements between suppliers and consumer countries;
- There is overuse of fertilizers in East Asia and severe underuse in Africa;
- In the United States there is a flat-line demand for fertilizer use but food production is increasing exponentially due to improved efficiencies and practices;
- Some of the practices to ensure sustainability include recycled fertilizer production, high analysis fertilizer, use of backhaul freight in transport, dust suppression, reduced use of packaging and zero carbon emissions handling systems, increased fertilizer efficiency and best fertilizer management practices;
- A case study for agricultural production in Madagascar was presented.

Questions and Answers

The questions and responses presented below are grouped by presentation rather than the order in which they were tabled. Note that responses and discussion are paraphrased and the result of back-and-forth conservation so should not be considered verbatim responses from the presenters.

Sustainable Automobiles

How much improvement in aerodynamics of vehicles to increase efficiency and is there room for further improvement?

- GM sells what is demanded by the marketplace so it undertakes an active management of aerodynamics strategy and this is considered when needed;
- Since the 1970s there has been roughly a 30-40% reduction in drag on vehicles;
- Still room for small improvements but need a technology breakthrough that is not yet apparent.

Is the En-V mini-car a sustainable strategy for the movement of people in the future?

- The En-V has 1/5 the physical footprint of a regular car. This vehicle is addressing the problems related to congestion where there is less and less space for parking in downtown urban centers;
- Studies have shown that these vehicles can be as efficient as a bus in moving people in a controlled environment;
- It was noted that despite the use of different and lighter materials e.g. plastic versus steel, in general the weight of cars has increased due to increased safety features that are required by law.

There is a UN resolution that creates a ten year decade for improved road safety to reduce deaths – is GM planning to support this and if so, how?

- The majority of road deaths (not damage) are from intoxication of the driver;
- It is generally felt that driver behavior dives the problem rather than the technology.

Alternate Fuels

Has the India success been repeated in other Southeast Asian countries and what is the role of the science and technology community?

- There are six more Indian cities that are implementing CNG conversions;

- There is a new policy from the Department of Energy that all new gas finds shall have a portion of their production allocated to the public transport sector;
- There is a technical agreement between India and Thailand for CNG conversion;
- There is increasing awareness in the ASEAN countries;
- The key contribution of the science and engineering community would be standard-setting and expediting the adoption of the technology.

Fertilizer Transport

What is done with the empty containers after product is delivered?

- It was noted that in many places food is not grown near where there is delivery of fertilizer – thus transport more inefficient;
- They are trying to optimize container movements through computer models;
- Trying to reduce transport costs by 1/3 through carefully planned backhauling.

Are there ways to mitigate the transport and more effective use of fertilizer now?

- There is not enough education in developing world for both farmers and policy-makers;
- Considerable uninformed thinking and application e.g. overuse of fertilizer, use of inappropriate fertilizers etc.;
- We need an educated farmers and to do that we need to provide information.

How many nutrients are washed away into our oceans, lakes and rivers and are there any ways to recover these effluents?

- Challenges include effective and efficient collection of the run-off broadly applied at the farm level;
- Food consumed in 2000, proportionally uses only 40% of the nutrients that were applied in 1900 – also the mix of nutrient is different and site-specific;
- We need to develop and provide a database on nutrients;
- University of British Columbia (Canada) has developed a process to extract phosphorous from wastewater and solid waste;
- The technology is coming but the challenge is to get municipalities to fund it.

Closing Remarks

D. Danyluk provided some closing comments:

- It is apparent that new technologies and methodologies for sustainable transport are evolving, but change takes time and this applies to the whole transport question;
- The presentations today amply demonstrate the importance of policy frameworks and policy statements as enablers of action. It emphasizes the continuing importance of the involvement of the scientific and engineering communities in the discussion and development of policies for sustainable development that can be implemented and sustained in close cooperation with our community.

He thanked the speakers for their fascinating presentations and to all who attended. The presentations will be posted on the WFEO-CEE webpage as pdf files.

Appendix A

List of Participants

NAME	ORGANIZATION
Lisa Bjerke	Sustain U. S. Youth
Chris Scarpino	HU/NEU
Klara Ellström	Swedish Delegation
Charlotta Broman	Swedish Delegation
Robynne Anderson	Farmers Major Group
Isabelle Coche	Croplife International
Hindou Oumarouś	Indigenous/Africa IPACC
Skip Anderson	U. S. Government
Lukosz Sosnowski	Polish Delegation
Deborah Shields	WFEO MG
Gisbert Glaser	ICSU
T.A. Renner	IUPAC
Mark C. Cese	IUPAC
Suzie Lemyrg	PWGSC
Nadja Sahborn	German Environment Ministry
Richard Jordan	Secretary, NGO/DPI Exec. Comm.
Yezushalmi Avi	MOT Israel
Shiuho Lin	Gray Panthers
Sorin Manoch	Ministry of Transport
Michael Gribble	Swiss Government Delegation
Haws Glaubitz	Netherlands Delegation
Alicia Cundall	Bahali International Community
Anjali Appadurai	Sustain U. S.