International Sustainable Energy Organisation for Renewable Energy and Energy Efficiency

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Setting a milestone in the transition towards the Clean, Sustainable Energy Age.

The 1st ISEO Congress in Geneva demonstrated clearly **the urgency for rapid changes in the energy sector towards a clean, sustainable world energy economy.** The many stakeholders and government representatives who attended the congress stressed the need for decisive action in the field of sustainable energy and energy efficiency. Delegates from Government Agencies, NGOs, Communities, Industry and Academia contributed their valuable inputs and viewpoints.

The main conclusions from the two work sessions supported the objectives and work priorities of ISEO:

- ISEO shall provide an Internet platform for the exchange of the many good results in the field of sustainable energy and energy efficiency.
- ISEO shall promote appropriate regulatory means and stricter enforcement for sustainable energy.
- ISEO shall enhance the financial viability of sustainable energy and energy efficiency.

From left to right: Paul D. Llanso, WMO, 1st ISEO Vice President Prof. Branko Bosnjakovic, ISEO President Johann Widmer and Executive Secretary Gustav R. Grob.

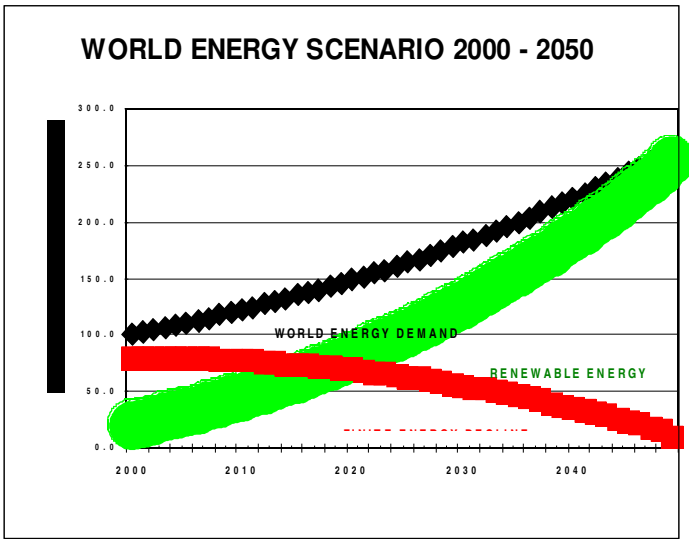
The *welcome address* was delivered by **Paul D. Llanso, WMO,** Chief of the World Climate Data Monitoring Program. He was actively involved in the previous clean energy conferences, leading to the establishment of ISEO. He pointed out how important renewable energy is for Greenhouse gas mitigation in order to bring the climate back into a natural balance causing less disasters. WMO supplies world-wide weather data for the planning and monitoring of renewable energy systems. These depend on the solar radiation, wind speeds, precipitation enabling the growth of biomass and feeding hydropower, tidal and wave energies as perpetual sustainable energy sources. He pointed out that the objectives of WMO and of the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC) are hence fully in harmony with ISEO's global objectives.

ISEO thanks Professor G.O.P. Obasi, Secretary-General of the World Meteorological Organization (WMO) for the hosting of ISEO for the two days.

ISEO Vice President Dr. Hans Hänni highlighted in his keynote speech *"Towards a World Energy Interface"* the networking concept of ISEO, and pointed out the information crisis with the time efficacy problem everybody is facing nowadays.

2nd Vice President Hans Hänni, PhD in Physics, Swiss citizen with many years of experience with ProClim, ETH Didactics and Networking. Dr. Hänni is now Secretary General of the Swiss Academy of Technical Sciences.

The *Scope and Goal of ISEO* was illustrated by **Executive Secretary Gustav R. Grob** with a 50-year energy scenario graph, assuming a world energy consumption growth of 2 %, under the condition that all conceivable energy efficiency measures are applied. Based on the fact that mineral energy resources are dwindling and that the protection of the health, biosphere and climate are enforcing the reduction of fossil fuel consumption, shown as the red line, clean, sustainable energy production must grow by at least by 5 % per year on the basis of the present 20 % share of renewable energy in the total energy mix (green curve).



ISEO Executive Secretary and co-founder Gustav R. Grob, F.IP, Swiss, industrial engineer, former manager of multinationals, Founder-Chairman of many ISO Committees and the CMDC-World Sustainable Energy Coalition, with a life-long experience in energy systems.

Stakeholder Needs and Demands to ISEO

ISEO President Johann Widmer chaired the World Congress and the Working Group on the stakeholder's needs and demands to ISEO, based on its statutes. This brainstorming included participants representing governments, local communities, the private sector and the academia from a dozen countries.

ISEO President Johann Widmer, Swiss citizen, graduate process engineer and lecturer has world-wide experience in industrial projects and renewable energy. Books and articles on Material Technology, Computers and Energy Storage.

The private sector's main concern was the assistance on the regulatory side for sustainable energy projects and for the economic feasibility of sustainable solutions, to be typically achieved by:

- **Improved rules and regulations**, giving sustainable energy a better chance over finite energy.
- Extending the loan **depreciation periods**
- Facilitating financing also for **new technologies**.
- Supporting and promoting **genuine entrepreneurship**
- Identifying attractive **bankable projects**
- Disseminating **profitable investment** examples
- Increasing the **credibility** of RE projects
- Supporting **viable, market based projects**

Governments have stressed the training needs of their personnel on sustainable energy infrastructure development plans and programs. Interesting examples from daily life of a ministry showed the importance of this topic. Know-how transfers with good practice examples should be made easier and thus more attractive for the administrative personnel.

Bringing stakeholders together was another concern of the participants and last but not least it was suggested that ISEO should promote the idea that the energy sector has to be sustainable and ethical.

Academia were presenting their needs. Many of the points from other stakeholders have been confirmed and it has been mentioned that the priorities are different in every region.

The final and important point by this group was the remark that a priority target group of ISEO should be the **students – they are the players of the future.**

ISEO Prerequisites and Priorities

Vice President Professor Branko Bosnjakovic chaired the WG on ISEO Priorities with following key resolutions:

ISEO shall be coordinating and servicing the national, regional and global initiatives for the transition to a clean, sustainable energy economy by functioning as information exchange forum for three pillars: economic, environmental and social, whereby the solutions must not export problems to other sectors, countries or generations.

- Priority shall be given to items with the most cost-effective impact on the transition towards sustainability.
- ISEO shall address regulations, economic incentives, international standards, codes of good practice, certification, and the need for appropriate education.
- Information exchange and networking with open access (web, newsletter, Internet links ….
- Capacity building for bridging information gaps (scientists, stakeholders, authorities, public ….).
- Organizing specific events: promote awareness, debate, consensus, action on, and removing obstacles to sustainable energy in priority target areas.

ISEO 1st Vice President Branko Bosnjakovic, PhD in Physics, Croatian and Dutch citizen, Professor of environmental management with long-standing experience in protection policy and legislation for sustainable development with the UN, the Dutch government and various NGOs.

Possible ISEO products at short & medium term

- **Internet portal** for integration & cross-fertilization.
- **Publications,** including directories; electronic newsletter; proceedings, background papers; feature magazine etc.
- **Global expert network** with a fellowship program.
- **Conferences, seminars, workshops & trainings** grouped regionally or by themes, stakeholder-oriented.
- **List of all future events** to be published in the field of sustainable and clean energy.
- **Development of global markets**, aiding developing countries and countries in transition.
- **Fostering global support:** partnerships with international organizations, lobbying, attending key meetings, interacting and networking with NGOs, pursuing participatory, transparent governance.
- **Social agenda:** cooperate with relevant organizations that address employment, the rights of gender and marginalized groups.

ISEO Financing Task

The most important financial task of ISEO is to motivate lenders and foundations to favor clean, sustainable energy projects, and to facilitate fast-track project approvals with long depreciation.

ISEO Work Program

The ISEO Work Program serves the implementation of the priority themes fulfilling the stakeholders' needs: in the first place economically viable solutions, emphasizing better energy efficiency, energy conversion from biomass, in particular bio fuels, solar energy and heat pump technologies for buildings. Cleaner transport, ecologically sound hydro and wind power, as well as geothermal and ocean energy systems are also in pressing demand.

The Views of the World Health Organization

Dr. Maged Younes, speaking on behalf of WHO Director General Dr.med. Gro Harlem Brundtland highlighted the negative impact energy emissions have on the health and the environment, particularly also in developing countries. The death rate caused by polluting energy sources is much too high.

Dr. Maged Younes, Professor of Toxi-cology & Biochemical Pharmacology, PhD at Tübingen University, Medical University Lübeck, Commonwealth Institute of Health, Sydney, German Federal Health Office, WHO Center for Environmental Health, Air Quality Guidelines in cooperation with IPSC.

Dr. Younes declared that WHO will establish a close working relationship with ISEO to abate pollution from hazardous energy systems in order to reduce casualties and prohibitive health cost. WHO looks forward to achieving tangible results from this inter-agency cooperation for the betterment of living conditions and health of humankind.

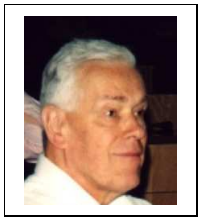
The Trends and Potential of Solar Energy

Professor Ernst Bucher gave a good picture about future possibilities, world trends and the potential of photovoltaic (PV) solar energy and related material sciences, based on his life-long experience with this technology. He pointed out that PV power has, in spite of two digit production growth rates in the last 20 years, still a long way to go.

The installed PV power of about 1 GW represents only 0.014 % of world energy consumption. In order to make a substantial contribution to the energy mix of several percent, an annual growth rate of 30 % over the coming decade is necessary.

The growth of PV production will lead to further cost regressions. SI thin film solar cells are the best bet for future PV growth. New types, such as transparent, colored, back-contact and bi-facial solar cells will expand the world market.

The full paper can be found in the "Blueprint for the Clean, Sustainable Energy Age" – available from ISEO webportal www.uniseo.org > Blueprint



Prof. Dr. Ernst Bucher, (emeritus) for Applied Solid State and Materials Science at Konstanz University and consultant to Lucent Technologies, USA, and previously researcher on semiconductors at Bell Laboratories. Lecturer at CLEAN ENERGY 2000.

Solar Energy Example of an Industrial Pioneer

TRISA, the leading Swiss manufacturer of advanced tooth brushes and top-quality electric appliances pioneered ecologically designed industrial buildings, serving as solar power houses feeding into the grid.

Technical data: 100 kWp monocristalline PV power modules mounted on four shed roofs of 780 m^2 surface.

Swiss energy engineer **Richard Durot** presented two PV cases and architect **Marc Steger** explained the ecological concept of these exemplary buildings, which serve as models for more of this kind of energetically advanced architecture.

The hitherto most economical flat roof PV concept was applied on a factory of FLUMROC, the largest insulation material manufacturer in Switzerland, producing solar electricity at only 0.6 CHF/kWh due to a higher efficiency in diffuse, cloudy conditions.

Advanced thin film solar panels on a new FLUMROC factory building with 21.8 kWp power capacity.

The Crucial Role of Energy in Architecture

Willi Weber, distinguished Professor of Architecture at Geneva University and Director of its Energy Center, highlighted the importance of architecture, since buildings use about 1/3 of the world energy production. With their facades and roofs they should become solar active and passive energy producers. Energy efficiency can be increased by proper insulation and air circulation with heat exchangers.

Example of a typical self-sufficient "Zero Energy" house in Germany featuring a combination of active and passive solar energy and space heating by biomass.

Shopping center in the UK built with active and passive solar energy features – also very well insulated.

More examples of energy conscious ecological architecture can be seen on the website www.idea-architecture.com and the website of the Passive and Low Energy Association PLEA all to be found under the ISEO webportal www.uniseo.org > Network giving access to an advanced world-wide circle of energy-conscious architects.

Under www.uniseo.org > Architecture > Barcelona Case the impact of an advanced solar law can be seen, which multiplied the solar active roof surface.

The Importance of Bio-Energy

Professor Ralph Sims from New Zealand and **Martina Sumenjak** from the Slovenian Biomass Association high-lighted the crucial importance of bioenergy, which ranks with about 13 % of the total world share of the primary energy mix as No. 4, after the three finite types of fossil fuels.

Prof. Dr. Ralph Sims, author of "The Brilliance of Bioenergy" is Director of the Centre for Energy Research, at Massey University, Palmerstone N, New Zealand. He also did the energy study for IPCC, the Intergovernmental Panel on Climate Change, Geneva

The potential of bio-energy could nearly cover all world energy needs, if harvested in a sustainable way. This is not yet the case in some developing countries, and it is counterproductive where virgin jungles are cleared wastefully to gain crop land.

Martina Sumenjak, M.Sc. President of SLOBIOM, the Slovenian Biomass Association, organized bio-energy conferences, attended the 1st World Clean Energy Congress in Geneva, and was co-editor of the historic Global Energy Charter for Sustainable Development.

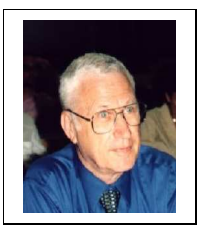
Liquid bio-fuels enjoy particular attention in Brazil and Europe and are seen as a gradual substitute for fossil fuels and as additives. Biogas is also gaining ground with thousands of systems installed in China and injected to natural gas pipelines in Switzerland - to quote two success stories. Solid biomass pellets for heating systems can now replace fossil fuels and are used in automated systems.

In Slovenia biomass contributes already 30.6 % to electricity production, which can be further increased to replace imported coal – which is a major part of the 70 % imported energy. The states of South-East Europe have an excellent bio-energy potential to reduce energy imports which are wasting foreign exchange and endangering the health and climate.

Geothermal and Ocean Energy

The huge potential of geothermal energy was illustrated by **Lucien Bronicki**, speaking for the International Geothermal Association IGA. Geothermal energy, producing heat to the extent of over 15'000 MW, plus 8'000 MW geothermoelectric power, generating about 50 TWh electricity, is ranking No. 6, after biomass and hydropower. The USA and the Philippines have already power generation capacities in the order of 2 GW each.

Ocean energy was also illustrated with examples of ocean thermal energy conversion (OTEC) systems, and experimental wave and tidal power stations, which also offer a huge renewable energy potential:



Lucien Y. Bronicki is Chairman of ORMAT Industries Ltd. Israel & USA and of the WEC Committee Israel; Executive Council Member of the Weizmann Insitute of Science & Technology and Member of the International Geothermal Association.

Hydro and Wind Power

Hydropower is ranking No. 5 world-wide by supplying about 6 % to the world energy mix with the potential to treble its world capacity. Wind power is the fastest growing renewable energy in absolute terms in recent years in good wind situations, outpacing most other renewable investments. EWEA, the European Wind Energy Association held their annual conference in Madrid, concurrently with the ISEO Congress, and was therefore not present, with apologies from their President Prof. Arthuros Zervos. The EWEA website can be accessed at www.uniseo.org > Network. The website of the International Hydropower Association IHA can also be accessed in the same way.

Blueprint for Clean, Sustainable Energy Age

This comprehensive ISEO guide to the future energy economy contains information about the roles of relevant UN bodies, NGOs, standardization, energy impacts on the economy, environment, climate and health, mineral energy resource depletion, total energy costing and world energy statistics, financing and all presently known solutions for clean energy production, clean transport, sustainable architecture with national scenarios and country case studies. It can be ordered from www.uniseo.org > Blueprint.

ISEO Working Group on Clean Energy Education

Education is the key element for the future protection of health, nature and climate. The recent Green Week of the European Union, where ISEO was presented, was conducted under the motto "Changing our Behavior". An interdisciplinary group of teachers started work on a new education policy. You may contact this group through the ISEO Central Secretariat in Geneva. See also the basic education principles on www.uniseo.org >Education

Flowers also to the hard working ISEO Angels:

Treasurer and ISEO Board Member Irène Baumgartner, has years of accounting and diverse office management experience in Swiss industry, international administration and in fiduciary services.

ISEO Chief Administrator Yvette Alimenti-Hesser; Belgian of Italian origin manages also the translation services with many years of experience as human resource manager with multinationals.

Data Base and Membership Administrator Marlyse Rehbein is a world-traveled Swiss Citizen of German origin who worked for banks, services and in industry all her professional life.

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