# Towards a World Energy Efficiency Link (WEEL)

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## Abstract

**Energy efficiency is high up in rhetoric and remains low in policy implementation. However, there will be no sustainable development without a radical switch from supply to demand side approaches. Substitution between energy sources will not solve the problem of greenhouse gas emissions. A group of energy, environment and development professionals calls for the establishment of a World Energy Efficiency Link (WEEL) in order to reference human, financial and information resources to stimulate policy implementation of energy efficiency across the society.**


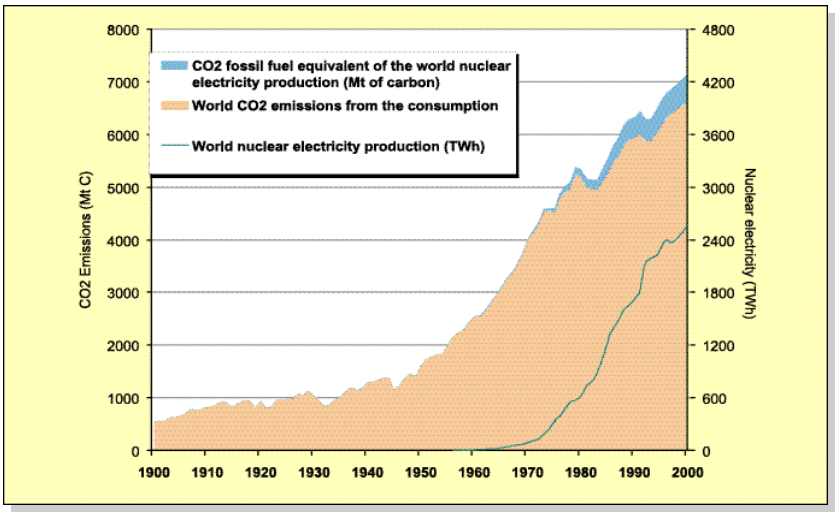


*Figure 1(a)*
*Historical development of $CO_2$ emissions and nuclear power generation worldwide through the 20th century*

The degree of development of a society can be expressed in terms of its increasing ability to meet a certain number of fundamental needs. They can be basic – food, housing, health, clothing – or more elaborated – like education, culture, exercise of civil rights, quality of the natural environment, leisure, etc. But most of them require energy in varying degrees, thus making the availability of energy an absolute pre-requisite for economic and social development.

With the development, during the industrial revolution, of large-scale techniques and engines for the production and transport of energy products, energy has become an industry of major economic and strategic importance. Through this evolution, energy is not anymore seen as a means for development, but an end for itself.

In this perspective, economic progress seems to be equivalent to a regular and unlimited increase in production and consumption of coal, oil, gas and electricity. In the meantime, energy policies are driven by increasingly powerful companies – either private multinationals or state-owned concerns – which pursue a goal of market domination.

It is thus no wonder that the development of the energy sector has almost exclusively been based on the growth of the "energy supply" (the means of production), to the detriment of the notion of service to the community and to individuals, i.e. the "energy demand".

This strategy has globally failed to fulfil the conditions of sustainable development. Firstly, the massive increase in the availability of energy has not resulted in the provision of "energy for all". On the contrary, great inequalities exist between the industrialised and developing countries,[1] and between rich and poor within individual countries.

Moreover, this growth, intended to support the social and economic development, can be a major threat to it. Fossil fuel resources, which account for about 90% of the world's commercial primary energy,[2] are not limitless, which creates tensions that can cause "energy crisis". In the 1980s, following the oil crisis, the levels of debt in the energy sector alone were becoming an objective barrier to economic development.

Also, damage to environment, life and health resulting from production and consumption of energy reaches unbearable levels. This includes the risk of major accident, air and water pollution, deforestation and desertification, land use and destruction of sites, production of long-lived radioactive waste, and enhancing of the greenhouse effect with its possible consequences on climate.

Despite a reduction in the growth of energy consumption in industrialised Western countries (since the 1970s) and in Central and Eastern Europe (since 1990), current trends would lead to a doubling of the world energy

1. The average per-capita consumption in North America is twenty-five times higher than in India or Africa. On the whole, about two billion people don't have access to modern forms of energy, especially electricity.

2. In 1999, oil accounted for 41%, coal and natural gas for 25% and 24%, nuclear energy and hydro-electric for around 8% and 3% (BP Amoco Statistical Review of World Energy 2000).

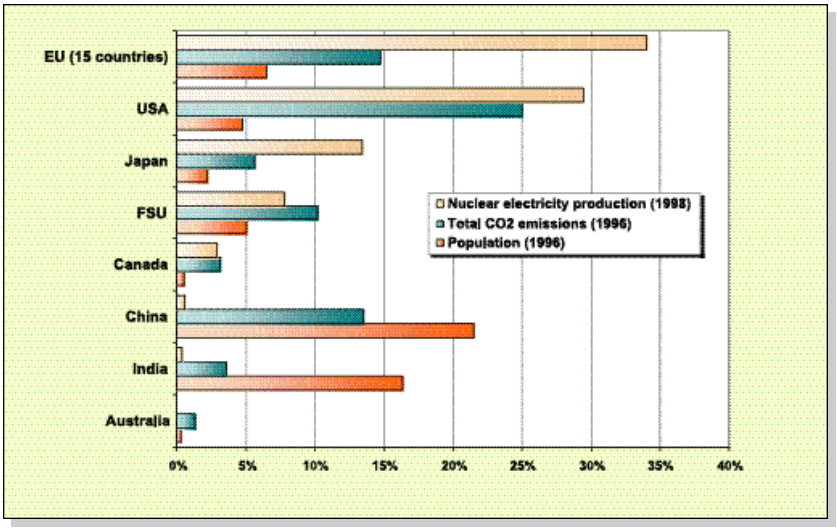


*Figure 1(b)*
*Share of world nuclear electricity generation, total $CO_2$ emissions and world population per country or region*

consumption in just a few decades. Far from constituting a sign of progress, this would actually lead, through the same mechanisms as those experienced in the past decades, to aggravated environmental damage and to depriving a major part of the world of development.

The solution to this terrific challenge cannot be found in a simple substitution of one or some supply sources to others. Because it would not modify the projected growth of energy supply, it could only shift from some tensions to others, not eliminate them.

This is best illustrated by the case of nuclear energy, sometimes presented as a potential global solution to climate change. As shown in Figure 1a, the virtually "avoided" $CO_2$ emissions through the use of nuclear power[3] are only marginal. But what is striking is the parallelism, with a delay explained by the later technological development of nuclear power, between the development of the nuclear industry and the tremendous growth of the whole energy sector over the last fifty years. In other words, nuclear energy is not an alternative to, but an expression of development patterns that have led to intrinsically wasteful and unsustainable economies "emphasising productivity to an obsessive degree".[4]

As illustrated in Figure 1b, countries or regions that are responsible for a large share of the world's consumption of fossil fuels – and thus of a large share of the global $CO_2$ emissions – are basically identical to the ones that generate nuclear electricity, both factors being linked to the level and pattern of development: the United States, which contributes 25% to the world $CO_2$ emissions, also produces almost 30% of the world nuclear electricity. This reasoning is not specific to nuclear power. It could eventually also apply to renewable energies – although they generally meet a higher level of acceptance – should they develop at the same level. Practically, there is, for instance, no rationale for installing solar cells on the roof of a house that has not been equipped with proper thermal insulation in the first place.

The case of France, cited as exemplary energy programme by the George W. Bush administration, is a good demonstration of the substitution strategy's limits. Started in 1973, the nuclear programme results in 2000 in a share of 75% of French electricity produced by its 58 large nuclear power reactors. But statistics show that France has not reduced its oil consumption – not more than its dependence on oil and its greenhouse gas emissions – over the same period, because while developing its huge nuclear programme it lost control over consumption in other sectors, especially the key sector of transportation. In other words, the saving in oil consumption in the electricity sector through the development of nuclear energy was more than outweighed by the increase in oil consumption in the transport sector.[5]

In 1998, a prospective study carried out by the French Planning Commission (Commissariat général au Plan) on energy scenarios for France over 2000-2020[6] showed no evident correlation between $CO_2$ emissions and nuclear power: The scenario with the lowest greenhouse gas emissions is not the most nuclear, but the one with the least growth of demand. The analysis has been confirmed by a report to Prime Minister Lionel Jospin in July 2000[7] examining scenarios for the electricity sector in France between 2000 and 2050. One of the main results is as follows: while the choice of primary electricity source (e.g. gas or nuclear) does not really discriminate the economics of scenarios, the rate of electricity demand growth[8] plays a major role. Energy efficiency is key: not only are "lower" demand scenarios on the whole less costly

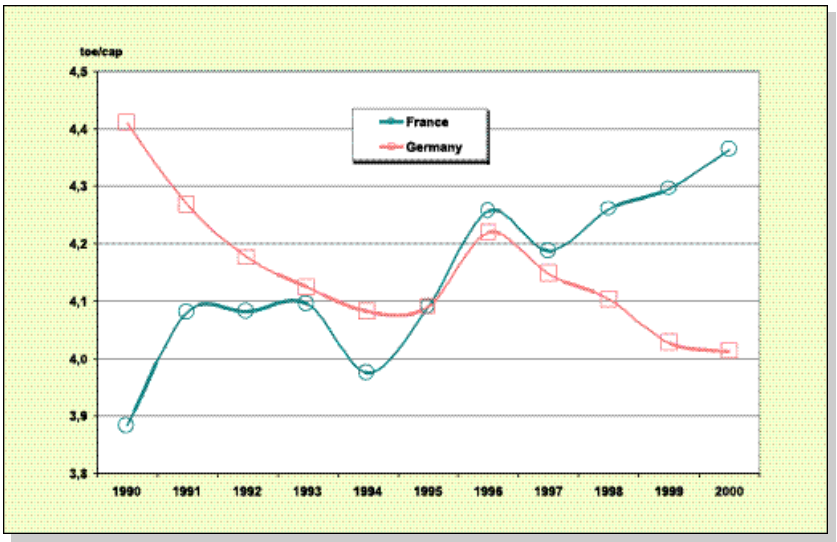


*Figure 2*
*Primary energy consumption per capita in France and Germany, 1990 – 2000*

3. The avoided emissions of average fossil fuel combustion (coal, oil, gas) equivalent to the world nuclear electricity generation (or about 650 g of $CO_2$ per kWh avoided). This is a highly conservative hypothesis since energy supply investments in many other energy supply technologies remain far below that level in the abatement of Greenhouse Gas emissions just as many energy efficiency programmes.

4. Harrap's definition for the French term productiviste.

5. Moreover, the introduction of the French nuclear programme as a means to become independent from foreign oil is essentially a myth, since the electricity sector in 1973 did not represent more than 13% of the French oil consumption.

6. Boisson, P. (Dir.), Energie 2010-2020 – Rapport plénier, Commissariat général du Plan, Paris, 1998.

7. Charpin, J.-M., Dessus, B., Pellat, R., Economic Forecast Study of the Nuclear Power Option, Commissariat général du Plan, Paris, 2000.

**Paris, Finnish Institute – 30 June 2000**

- We, the undersigned, participants in the Energy Efficiency Seminar, from 28-30 June 2000 in Paris, organized by WISE-Paris and ICE and supported by the Alliance for a Responsible and United World;
- Agreed on the creation of the World Energy Efficiency Link (WEEL) to strengthen energy efficiency among peoples, cultures, and countries worldwide.
- This initiative is particularly timely given the environmental impacts associated with energy production and consumption, the threat posed by climate change, the ongoing restructuring of energy markets globally, and the need to find sustainable development pathways.
- The activities of WEEL will include creating linkages among organizations and individuals concerned by energy-efficiency issues; expanding the discussion of energy efficiency to a broader public; and integrating energy efficiency into all sectors of human activity.
- Signed: Ada Amon (Hungary), Garegin Aslanian (Center for Energy Policy, Russia), Peter du Pont (International Institute for Energy Conservation, Thailand), Adam Gula (Krakow Institute for Sustainable Energy, Poland), Julie Hazemann (World Information Service on Energy-WISE-Paris, France), Zou Ji (Tsinghua University, Renmin University, China), Victor Kotomkin (Kola Energy Efficiency Centre, Russia), Bernard Laponche (International Consulting on Energy-ICE, France), Raul Montenegro (FUNAM-Environment Defense Foundation, Argentina), Lorenzo Pagliano (Italy), Lydia Popova (Center for Nuclear Ecology and Energy Policy, Socio-Ecological Union, Russia), Mycle Schneider (WISE-Paris, France), Anjali Shanker (Innovation Energie Developpement-IED, France), Bent S¯rensen (Roskilde University, Denmark).
- (31 additional experts, government officials and NGO representatives from 15 countries have endorsed this statement since).

*Figure 3*
*Creation of the World Energy Efficiency Link (WEEL)*

than "higher" ones – with more than 2 billion Euros of annual savings – but they also produce in most cases a cheaper kWh.

Also, highly centralised and integrated energy systems, which result from the "supply side" based policies, offer a strong resistance to a shift towards a "demand side" policy based on energy efficiency. France and Germany, two countries quite similar in terms of demographic and past economic development, offer an example, illustrated by the evolution of their energy consumption per capita (Figure 2). The German system, with less centralisation of economic and policy decision-making, allowed in the 1990s an inflexion of trends towards a reduction of demand, an evolution that the highly integrated French system could not trigger, in spite of persistent rhetoric to this effect. Also Germany has been ruled since 1998 by a coalition government that has clearly opted for the medium term phase-out of nuclear power and a strong support of energy efficiency and the development of renewable energy sources.

There will be no sustainable energy future without a strategy based on energy efficiency, and this calls for an in-depth and long-term change in energy policies. The objective is to improve the response to the needs of development with much lower specific energy consumption ratios. Industrialised countries could reduce their energy consumption significantly, while developing countries could increase their consumption level as necessary, but with growth rates far lower than those experienced in the past by the rich nations.

Energy efficiency is a "win-win" strategy, and the only one in the absence of a technological miracle that would provide a solution to everyone's energy problem. It has obvious positive consequences for development and environment. It lightens the absorption of financial resources for the energy sector, thus making more resources available for other sectors. And whenever, for any given use, energy consumption is reduced, so are also pollution and risks related to energy production.

The potential is already there: for the same service, and more generally the same level of development, it is possible to consume far less energy products than at present,[9] at a lower "service provided" cost. However, what is predominantly important is the interaction between technology, economics and stakeholder behaviour. Energy efficiency is directly linked to the choice and organisation of infrastructures and to the quality of equipment and appliances used.

But, unlike nuclear or renewable energies, energy efficiency suffers from a formidable handicap: it is neither immediately visible nor spectacular. It has no powerful lobby, and the realisations stay by far short of the numerous policy statements of the major players. The productivity culture, inherited from the industrial revolution, is so firmly anchored in the leadership mentality that most decision-makers do not fully perceive the advantages of an energy efficiency policy.

An energy efficiency policy extends to everybody. The partners in potential actions are the consumers, the industrialists and the local, regional and national authorities, as well as international bodies. Although priorities need to be defined, energy efficiency is not designed to apply at some social, political and geographical levels, or in some economic sectors rather than others.

Therefore, the key to success is the organisation

8. The scenarios are based on the same growth of economy, but on two hypothesis for the evolution of electricity demand over 2000-2050: "low" (+46%) and "high" (+98%) cumulated growth.

9. For instance, the use of the best household electrical appliances already on the market would save about 40% of the current consumption of electricity.

of transversal partnership and of the tools and means required for the implementation of dissemination initiatives combined with a permanent exchange of experience gained. This was the basic analysis of the participants in an international seminar organised in Paris, June 2000, by WISE-Paris and International Consulting on Energy (ICE)[10] in the framework of the "Energy Workshop" of the Alliance for a Responsible and United World, attended by 18 representatives from nine countries. As a key result, the group decided to launch the World Energy Efficiency Link (WEEL) (Figure 3).[11] In a first step, the initiative attempts to lay out and agree on a fundamental general analysis[12] and then aims to link up and reference already pertinent existing networks, experts, financing schemes and information sources. Only in a third step will it be attempted to fill in the gaps. Finally, education shall play a major role in the orientation of WEEL.

The co-ordinators of the WEEL Project, from WISE-Paris and ICE, recently set up an electronic forum (working like a closed mailing-list)[13] to discuss strategy documents and exchange information linked to the definition and implementation of energy efficiency in all parts of the world. It is presently working on the elaboration of "proposition files" to be presented and discussed by the "Assembly of the Citizens of the Earth" to be held in December 2001, in Lille (France).

The WEEL initiators pointed to the need for a "smart clearing house", which identifies and analyses existing information and information sources. This will be the first purpose of a web site to be set up by the group over the coming year. A parallel task will be the identification of what is lacking in the present information systems and proposing the means to make up for such inadequacies.

WEEL has been launched and it is one of these projects that will live, with and through the people who are convinced of its well-founded purpose.


## ABOUT THE AUTHORS

Yves Marignac is Assistant Director of the World Information Service on Energy, Paris (WISE-Paris),* which he joined in 1997 after three years of research on information about nuclear energy in Paris-XI University and in the French nuclear industry (CEA and STMI). He has authored or contributed to many studies on energy and global environmental issues and participated in 1999-2000 in the economic evaluation of the nuclear option for French Prime Minister Jospin. He is also Chief Editor of Questions d'énergies, a WISE-Paris project of information service on parliamentary work on energy.

Mycle Schneider is Co-founder and Executive Director of WISE-Paris,* Chief editor of Plutonium Investigation and acts currently as consultant to the French, Belgian and German Governments as well as to a broad range of institutions and NGOs. He has presented invited evidence to the European Parliament as well as Parliaments in Australia, Belgium, France, Germany, Japan and the UK House of Lords. In 1997 he received the Right Livelihood Award (Alternative Nobel Prize). In 2000, the Paris-based Fondation pour le Progrés de l'Homme named him co-organiser of the foundation's energy efficiency project.

*Note: WISE-Paris is entirely independent of any other organisation carrying the name "WISE".

## IF YOU HAVE ANY ENQUIRIES REGARDING THE CONTENT OF THIS ARTICLE, PLEASE CONTACT:

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10. A Paris-based international group of independent energy consultants.

11. All documents of the Energy (Efficiency) Workshop, including proceedings of the "First Energy Efficiency Seminar", the first strategy document and the draft of its "proposition files", are available on the web site of the Alliance: www.alliance21.org/en/themes/energies.htm.

12. Idem.

13. For more information on the electronic forum see www.alliance21.org/forums/energies or, if you are interested, contact the moderation team (Julie Hazemann, Bernard Laponche, Mycle Schneider) at energies@echo.org.