

About Peace Making Effects of Solar Technologies

Global challenges and reasons of crises

How can solar technologies contribute to create peace?

Proposals for institutions for sustainable development

Proposals for a global solar cooker school program

Dr.-Ing. Dieter Seifert, Neuötting

20. Annual Meeting EG-Solar, Altötting, April 2013

6. Solar Conference InterSol, Salzburg, June 2013

(in parts translated from German)

Global Challenges

A growing population on a planet with ending resources, descending fertile soil, water scarcity and threat of climate change



Only a short period remains for the human transition to a sustainable global society. It is time!

Exceeding the „Guard Railing“?

"Even a restriction of the temperature increase to 2 degrees Celsius appears currently hardly accessible. This "2 degrees Celsius-goal" climatologist declared as a "guard railing" because the consequences of such an increase seems still manageable."

Klaus Töpfer:

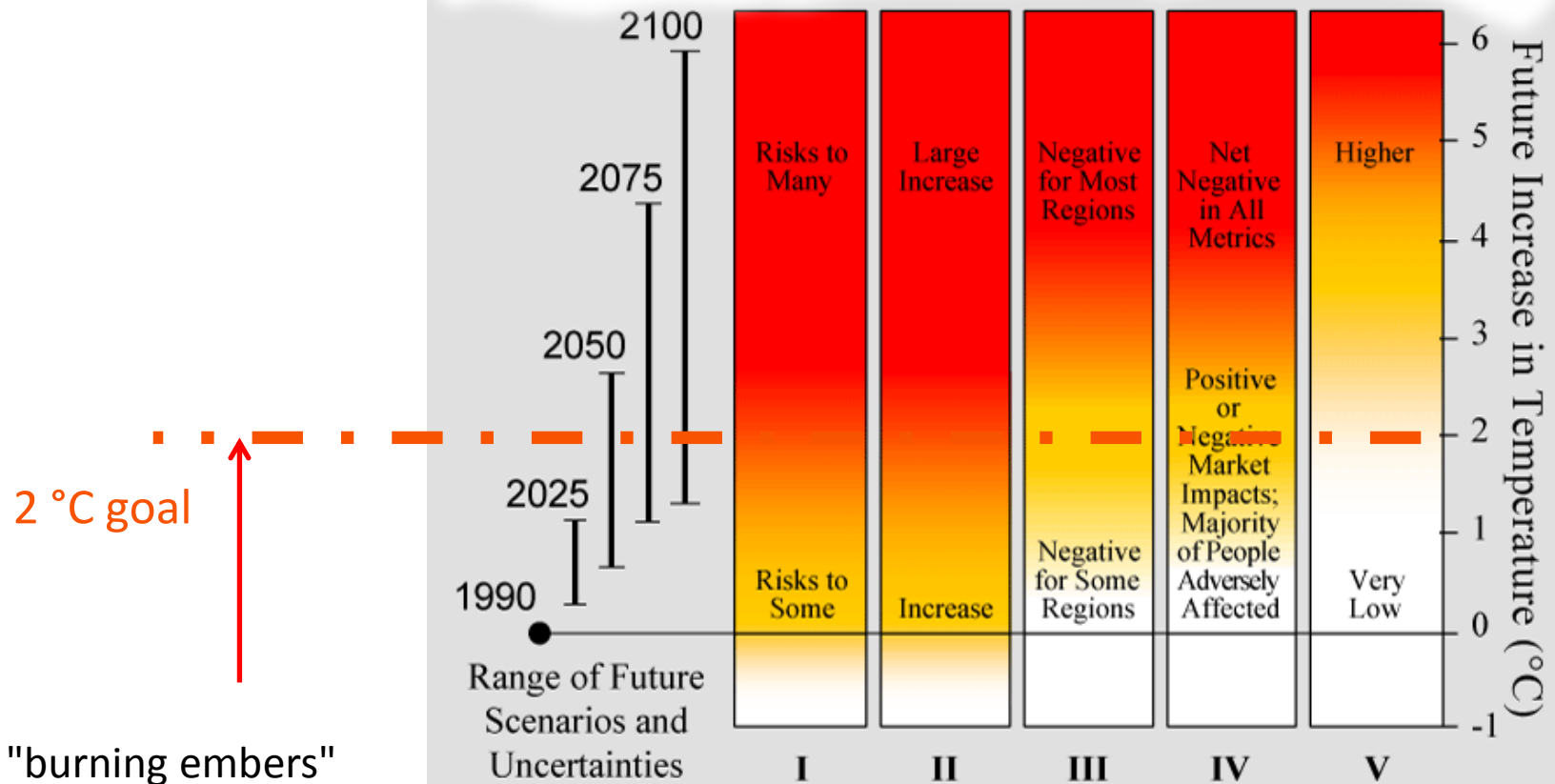
Quotation translated from:

Für die Globalisierung der Nachhaltigkeit.

Atlas der Globalisierung (2006), p. 10;

LE MONDE diplomatique

Risks and Impacts of Climate Change



The "burning embers" diagram was produced by the IPCC in 2001

Quotation:
http://en.wikipedia.org/wiki/Reasons_for_concern

- I** Risks to Unique and Threatened Systems
- II** Frequency and Severity of Extreme Climate Events
- III** Global Distribution and Balance of Impacts
- IV** Total Economic and Ecological Impact
- V** Risk of Irreversible Large-Scale and Abrupt Transitions

Advice from Prof. Schellnhuber

Director Potsdam-Institute for Climate Impact Research (PIK)

"We must avoid a rise in temperature of more than 2 °C above pre-industrial times. This means that the CO₂ concentration may not be stabilized above 450 ppm. Everything else would strike me as irresponsible. "

What should be done? (1)

Answers from an interview of
German Watch with Prof. Schellnhuber

<http://germanwatch.org/rio/hjsint06.pdf>

"Firstly, it is about 'avoiding the non-controllable'. If we bring the planetary system or large regions in a state from which we have no historical comparison and the humanity is not prepared, then the limits of adaptation are reached very quickly."

Prof. Dr. Dr. h.c. Hans Joachim Schellnhuber
Director of Potsdam-Institut für Klimafolgenforschung (PIK)

What should be done? (2)

“Secondly, it comes to ‘shaping the inevitable’.
For example: A certain sea level rise in the coming decades and centuries is already inevitable. We must adapt to all these developments, but just need to support the most vulnerable people in their adaption ...”

Prof. Dr. Dr. h.c. Hans Joachim Schellnhuber
Director of Potsdam-Institut für Klimafolgenforschung (PIK)

What should be done? (3)

“And the third priority is the accelerated conversion to a sustainable society. It applies to strengthen the resilience of systems in general.”

Prof. Dr. Dr. h.c. Hans Joachim Schellnhuber
Director of Potsdam-Institut für Klimafolgenforschung (PIK)

Peacemaking Innovations

For sustainability: They create lasting resources and minimize the damage

Pay attention to subsidiarity: as decentralized as possible – only as centralized as necessary

For a just and sustainable development: Innovations are vital for developing countries

Innovations arise from concern and develop in phases

For universal peace: Solve global challenges in solidarity.

How Solar Technology is Peacemaking?

- Avoids conflict over limited resources
- Avoids conflict arising from the use of limited resources (greenhouse gas emissions, waste)
- Solar energy is ideally suited for decentralized, self-determined use (complies with the subsidiarity principle)
- The global solidarity cooperation in sustainable development through use of solar energy has immense impact for peace

Diffusion of Sustainable Technology Instead of Unemployment

Transition to sustainable technologies provide a multitude of tasks, not only in manufacturing, but also in the campaign for long lasting use, training about the advantages of use, adaptation to local conditions and extension of applications.

Modern production methods should provide for lower cost through high volumes, ensure high quality and high durability.



Solar workshop in ICNEER / India



Escuela Taller, Bullas/Murcia/Spain¹¹

Example of International Solidarity



Altiplano Bolivia, Project SOLIN of
José Angel Garrido Vazquez, Madrid

Misery of Refugees and Consequences for the Environment



"In December 1996, more than 600,000 refugees from Burundi and Rwanda were housed in the Kagera region in north-west Tanzania.

More than 1200 tons of firewood were consumed each day - a total of 570 square kilometers of forest was affected, of which 167 square kilometers was severely deforested."

Source: Refugees and the Environment – Caring for the Future, UNHCR, Geneva, p.12

An Example of Conflict Prevention: 3700 Solar Cookers in Nepalese Refugee Camp

“One of the main sources of tension between the refugees and the host communities was the illegal collection of firewood by the refugees from host community forests. The RCU officers noted that since the introduction of the solar cookers there have been no reported cases of illegal firewood collection by the refugees.

The refugees interacted with also agreed that there is no need for them to illegally fetch firewood from the host community forests because the solar cooker is supplementing their firewood need.”

Vajra Foundation Netherlands-Nepal; Solar Cooker
Project Bhutanese Refugee Camps

Amy Smith:

“The Best Solutions Are Hiding in Plain Sight”

„Looking at things from a more basic level, you can come up with a more direct solution, and a lot of people go, well, doh, that’s really obvious!“.... „It may sound small in theory, but in practice it can change entire economies“

Amy Smith (MIT; D-Lab)



Quotation from :
A. Steffen (ed.):
WORLDCHANGING –
A User`s Guide
for the 21st Century.
Abrams, New York

Amy Smith, center, with students and inventions (from left: phase-change incubator, grain mill and sugarcane charcoal). Source: P. Kennedy: NY Times 30.11.2003

“Not Paper, but Prototypes”

International Development Design Summit at Massachusetts Institute of Technology (M.I.T.) Sept. 2007

MONDAY, SEPTEMBER 24, 2007

The New York Times

SCIENCE & TECHNOLOGY

Inventing Solutions for the Third World

By ANDREW C. REVKIN

CAMBRIDGE, Massachusetts — At the Massachusetts Institute of Technology, an assemblage of tinkers from 16 countries welded, stitched and hammered, working on rough-hewn inventions aimed at saving the world, one village at a time.

M.I.T. has nurtured dozens of Nobel Prize winners in cerebral realms like astrophysics, economics and genetics. But lately, the institute has turned its attention toward concrete thinking to improve the lives of the world's bottom billion, those who live on a dollar a day or less and who often die young.

This summer, M.I.T. played host to a four-week International Development Design Summit to identify problems, cobble together prototype solutions and winnow the results to see which might work in the real world.

The workshop began in mid-July, with the arrival of nearly 50 visitors from Brazil, Ghana, Guatemala, Tanzania, Tibet and other places.

Mohamed Mashaal, a young British engineer headed for a job with BP on the North Sea this fall, poured water into a handcrafted plastic backpack worn by a design part-

Modest technologies that could help reduce global poverty.

ner, Bernard Kiwia, who teaches bicycle repair in rural Tanzania and hopes to offer women there an easier way to tote water for long distances.

Sham Tembo, an electrical engineer from Zambia, and Jessica Vechakul, an engineering graduate student at M.I.T., slowly added a cow manure puree to a 23-liter bucket holding charcoal made from corncobs. In the right configuration, the mix might generate enough electricity to charge a cellphone battery or a small flashlight for a year or more.

The flurry of activity was taking place at D-Lab, a research center and set of courses at M.I.T. devoted to devising cheap technologies that could have a big effect in impoverished communities.

The work itself was often two steps back,

not one step forward. As Lhamotso, a young woman from Tibet, and Laura Stupin, who just graduated from Olin College, wrestled with a whirring Rube Goldberg mash-up of bicycle and grain mill, the chain slipped with a loud clang. “We have a real friction problem,” Ms. Stupin yelled.

Amy Smith, a lecturer at M.I.T., was the main creator of the summit (www.iddsummit.org). “Nearly 90 percent of research and development dollars are spent on creating technologies that serve the wealthiest 10 percent of the world’s population,” she said. “The point of the design revolution is to switch that.”

Developing a pedal-powered grain mill or a backpack for water, as workshop participants did, was only a first step. The teams also had to be sure that their creations could be built of local materials cheaply enough to be bought by the world’s poorest people, that they could be fixed easily and fit ways of living that have deep-rooted rhythms.

Ms. Smith said she wanted to avoid having the workshop end up as yet another academic exercise. This time, she said, the goal was “no paper, just prototypes.”

Half a dozen volunteer mentors helped the participants make their ideas more

concrete. The mentors’ task was making things work.

After a career building contraptions on movie sets, Jock Brandis now helps run the Full Belly Project, which develops machines to simplify village work. Mr. Brandis noted that the budget for developing a peanut sheller for a Malian village was far different from that for building a camera-toting vehicle in rural Mexico to film the actor Antonio Banderas galloping through the desert as Zorro. But the challenge of filling a niche with limited materials and tools is similar.

At the workshop, Mr. Brandis examined with approval one group’s design for an oven with three grates of progressively finer mesh to hold charcoal fuel, so that big pieces that have not burned down stay separate from more fully consumed fuel, limiting harmful smoke.

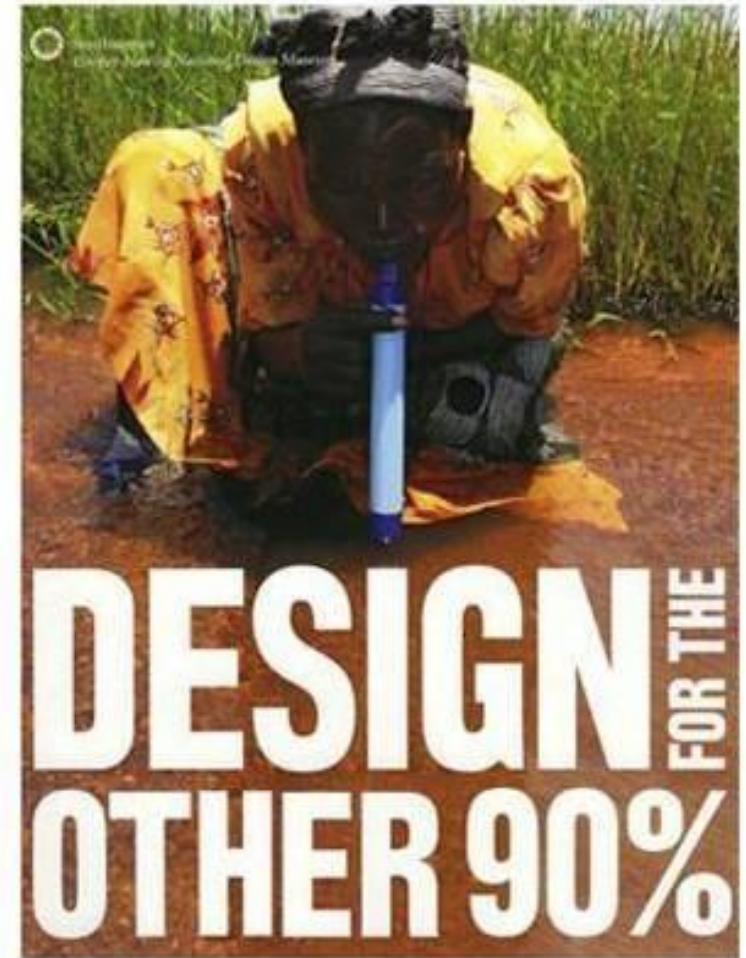
“What you try to do in virtually every situation is make their lives more efficient,” he said. “That’s what the big revolution in America was between 1860 and 1960 — that a person doing a day’s work can produce a lot more product. And that means time is more valuable and that means he has more time to do other things.”

Reversal Necessary

“Nearly 90 percent of research and development dollars are spent on creating technologies that serve the wealthiest 10 percent of the world’s population.”

“The point of the design revolution is to switch that.”

Amy Smith,
Lecturer at Massachusetts Institute of
Technology (M.I.T);
(www.iccsummit.org) in an article of the
New York Times, 24. Sept. 2007



Challenge of Climate Change as an Opportunity

We may have only a few years time for a humane transition to a sustainable civilization.

Solidarity is a prerequisite for peace in the world.

Transfer of sustainable technology is peace-building for a just and sustainable development.



Assembling of highly efficient lamps
in Tanzania

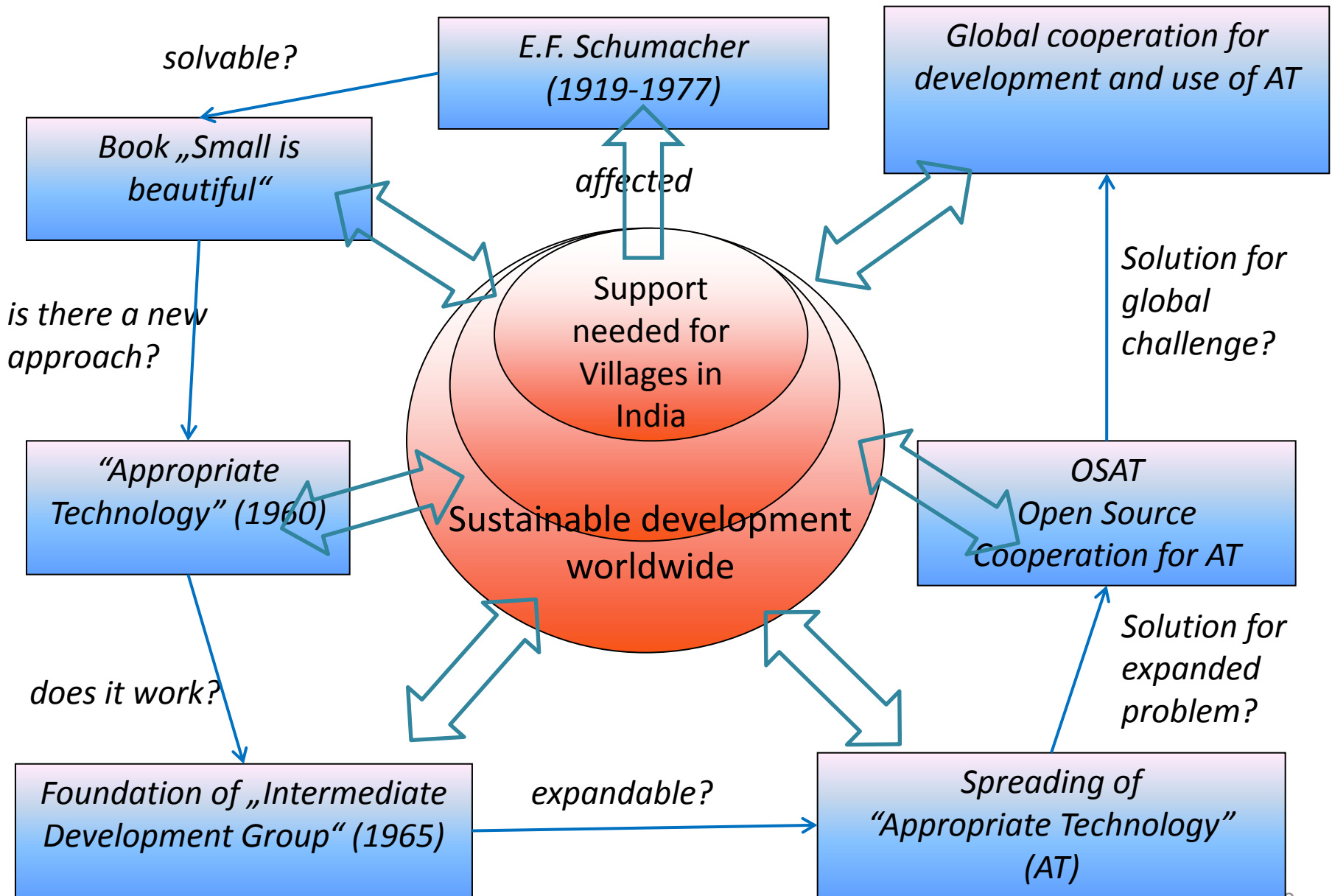
www.solarprojektfreilassing.de

Foto: S. Popp, Freilassing

Criteria for Technology for Sustainable Development: Perma-Technology

- It improves living conditions
- causes no damage
- is fault-tolerant
- is beautiful and easy to use
- uses renewable resources if possible
- uses non-renewable resources only if recyclable
- is easily repairable and has very high durability
- can be adapted to local conditions if necessary
- can be further developed iteratively
- provides high value, especially in the use and where possible, through jobs

Phases of Innovation – Example: Appropriate Technology (AT)



Example of a Technical, Economic and Social Innovation: Appropriate Technology (AT)

“What would be the appropriate technology for rural India or rural Latin America or maybe the city slums? ... That technology would indeed be really much more intelligent, efficient, scientific if you like, than the very low level technology employed.”



“But it should be very, very much simpler, very much cheaper, very much easier to maintain, than the highly sophisticated technology of the modern West.”

E.F. Schumacher: CARING, FOR REAL, New World News 17. Sept. 1977

Prevention of Food Losses

Example: Solar Dryer

“Estimates of production losses in developing countries are hard to judge, but some authorities put losses of sweet potatoes, plantain, tomatoes, bananas and citrus fruit sometimes as high as 50 percent, or half of what is grown. “

FAO: Prevention of post-harvest food losses: Fruits, vegetables and root crops

www.fao.org/docrep/T0073S/T0073S01.htm



Institutionalization of Sustainable Development

- Programs to adapt to climate change
- Agenda 21 working groups, “future workshops” (R. Jungk)
- Houses of the Future” with actual permanent exhibitions
- Programs for solar lamps, biogas plants, food preservatives, teaching gardens etc. (see also: WORLD CHANGING – A User’s Guide for the 21st Century. Abrams, New York)
- Participation of television: TV Innovation Institutes
- A global school solar cooker program for 200 million solar cookers connected with programs for firewood saving stoves and thermos technology

Ways Out of the Crisis by Solar Technologies

- Speaking about global challenges facing humanity, the urgency of overcoming youth unemployment, etc.
- Large funds for adaption to climate change are promised for developing countries.
- But the development of appropriate technology is still in its infancy and its peacemaking effect is hardly recognized.
- Distribution trough the worldwide school system has many advantages.
- In addition, Innovation Institutions are necessary which cooperate with schools, universities and with television.

Peace Making Effects of Solar Cooker Programs

Solar cooker workshops and solar cooker courses should be part of the school curriculum. If this unfolds into a worldwide collaboration, the global solar cooker program might create an immense peacemaking impact.

Worldwide school programs, exchange of experiences and cooperation for the dissemination of solar cooking, thermos technology and solar food preservation is effective peace work.

The solar cooker is a wonderful symbol of peaceful cooperation and the preservation of creation.

Barriers to Spreading of Appropriate Technology (AT)

- i) AT seen as inferior or “poor person's” technology,
- ii) technical transferability and robustness of AT,
- iii) insufficient funding,
- iv) weak institutional support, and
- v) the challenges of distance and time in tackling rural poverty.

Source: I. Zelenika, J.M. Pearce: Barriers to Appropriate Technology and Growth in Sustainable Development. Journal of Sustainable Development, Vol. 4, No.6 (2011)

How to Overcome Obstacles of the Dissemination of Appropriate Technology?

- Criteria of Appropriate Technology (AT) should not be a real inhibitor (e.g. if only local materials are allowed)
- Not to spread "poor people's technology"
- Do not adhere to primitive production methods and materials > AT-Plus
- Provide funding sources (adaptation funds ...)
- Grant institutional support, including the school system
- Exploit the use of television, not only the Internet

No Transfer of “Cheap Oil”-Technology

"Amory Lovins travels with a suitcase through the world in which sticks, he says, 200 large power plants and all the oil flowing through the Trans-Alaska Pipeline.

In reality he carries around energy-saving light bulbs, motors, shower heads and similar fittings with it. They are used to bring a few basic facts about energy among the people."

Quotation translated from:

Donella H. Meadows:

Die veruntreute Erde – Ökologie im Alltag (1995)

Kapitel: Ein Negawatt gespart - ein Negawatt verdient

Hinder Patents Sustainable Development?

The European Patent Office provides approximately 80 million patent documents in the Internet for free view (www.espacenet.org).

A large proportion of patents have expired and are available as repositories of knowledge, and contact with the inventor can provide valuable information.

For valid patents, license agreements are necessary.

Innovation Institutes for Sustainable Development can ensure that beneficial developments/inventions are elaborated and provided in an advantageous manner.

This Innovation Institutions should be connected to the television in order to promote the dissemination of durable information ("TV Innovation Institute")

The Possible Role of Television for the Sustainable Development

TV Innovation Institutes can pick up on the pressing issues of our time.

Television can thus carry out its educational mission. It has a high potential.

It fails otherwise to responsibly contribute to solving global challenges.

The peacemaking effect of the participation of television in the dissemination of sustainable technology is immense.

Advantages of TV in the Support of Sustainable Development

Television reaches almost all people worldwide and can raise awareness of global challenges

It can show trends by illuminating the past and visualize possible future in the form of scenarios

It can arouse enthusiasm, motivation to change and thereby promote sustainable behavior

It can overcome resistance and convince people on the way to sustainability

It can promote innovations for sustainable development as there are appropriate institutions to create connections

Fuelwood Crisis



Foto:
Bistumsblatt
Passau:
Maria from
Guatemala

One billion cubic meters of firewood are burned annually in an unsustainable manner. 2 billion people are affected by the fuelwood crisis. The produced CO₂ emission corresponds approximately to the CO₂ emissions of Germany and Austria

200 Million Solar Cookers and Fuelwood Saving Cook Stoves

If 2 billion people are affected by the fuelwood crisis, then about 200 million solar cookers (and firewood saving stoves and thermos containers) are required.

200 million times 600 watts = 120 billion watts of installed capacity, i.e. the capacity of more than 100 nuclear power plants.

However, with only one tenth of the cost of installation, without running cost, no additional expense, no risks, with full and easy recycling.

A peace-making technique instead of the risk for present and future generations.

A Global Solar Cooker Program is Necessary



Encuentro Solar, Parque de las Ciencias
Granada/Spain

The program can assist the start of the much-needed change of our treatment of the earth's resources.

It can form a forum for global peacekeeping exchange of experience and of helpful cooperation.

The Solar Cooker – Instrument of Experiential Education

- Practical skills
- Social behavior and ethics
- Environmental education
- Physics, mathematics
- Nutrition, home economics
- Geography, etc.

Peace work through global
exchange of experiences



Joint Building of Millions of Solar Cookers in Schools

Every child, every youth, should build solar cookers in school and learn solar cooking.

They can discover the amazing diversity of possible applications and solutions, collaborate creatively and work with enthusiasm.



School Workshop in Winklham/Upper Bavaria

School Projects and School Partnerships



School Kitchen at Zaroli-Monastery, Gujarat/India



School Partnership Salzburg-India
Photo: Peter Machart



Peace School in Afghanistan
Photo: Dr. Eroes

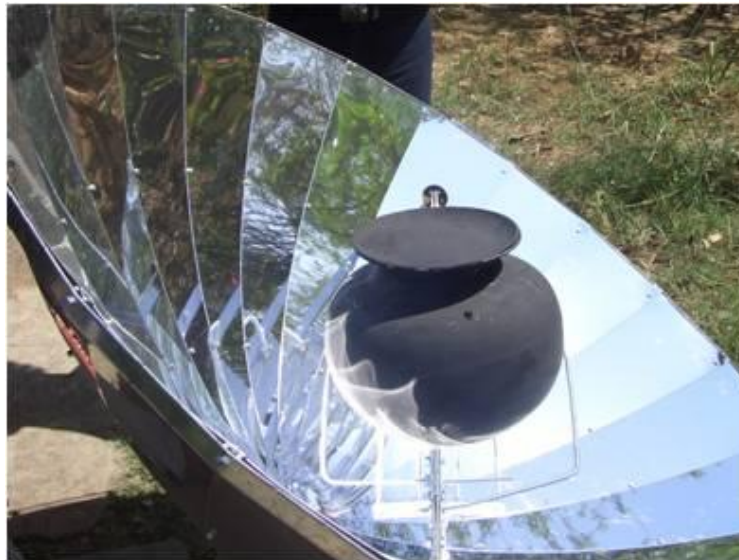
The Parabolic Solar Cooker is a Useful and Peacemaking Instrument

It is adapted to all cooking and baking tasks for conservation and water disinfection with high power,
it is safe and produces no harmful emissions,
it is durable: it can be passed down through the family,
it consumes no finite energy during operation,
it is easy to repair and fully recyclable,
it is instructive and motivating in many ways,
it can be built in community,
it can be used in the classroom in a variety of ways,
it provides practical experience and experience of success,
it stimulates creativity, and it is ideal for global cooperation

Boiling of Water - One of the Tasks for the Solar Cooker



Fountain in Valsad/Gujarat



With a parabolic solar cooker (SK12) with diameter 1.4 m 48 liters of water were boiled per day in ECSCR test in Almería/Spain

At least four billion liters of drinking water per day are needed for 2 billion people;
200 million solar cookers should be used

Greater Uses Than One Thinks ..

"It is simply incomprehensible to me how little is recognized, what you can do with the solar cooker"

Imma Seifert



Products prepared with a parabolic solar cooker by Imma Seifert

Solar cooking should be taken for granted



Source: Süddeutsche Zeitung LKR, 30.5.1994 Artikel:
„Wunder dauern etwas länger“ („miracles take a bit longer“)



Photo: Klaus Schulte
Project Banti Bhandar, Nepal,
Rotary Sweden 41

From a Proposal for a TV-Institute for Sustainable Development

“Do we wish to proceed in the direction of a society of “greedy and gapers” who exceed their limits more and more, who increasingly execute brutal fights for scarce resources and who fail to build humane ways,

or do we want to recognize the signs of the times, seizing opportunities in the hope that it is not too late and in the confidence that we will find human ways to the future?”

from a proposal of D. Seifert for a
“Television Institute for Sustainable Development” (1997)

Jean Ziegler:
How the Hunger Occurs to the World?
Explained to my son

4.8 billion of 6.2 billion people live in one of the 122 so called developing countries, usually in undignified conditions.

100,000 people die every day from hunger or its immediate consequences.

Every seven seconds a child under ten years starves to death.

Jean Ziegler is the Special Rapporteur to
United Nations Human Rights Commission on the Right to Food.

Title of the original edition:

“La faim dans le monde expliquée à mon fils” Éditions du Seuil, Paris, 1999

J. Sacks: The Dignity of Difference – How to Avoid the Clash of Civilisations

"Reverence, self-control, humility, a sense of limitations, the ability to listen and responding to human suffering - all these are not virtues which produces the market, but there are properties that we desperately need, if our global civilization is to survive."

Quotation translated from: Jonathan Sacks: Wie wir den Krieg der Kulturen noch vermeiden können. Gütersloher Verlagshaus (2007)

Original: The Dignity of Difference. How to avoid the Clash of Civilisations. Continuum, London/New York (2005)

J.D. Sachs: About the Inexhaustible Effects of Ideas

"The beauty of ideas is that they can always be used without being exhausted. ...

Therefore, we can imagine a world in which everyone gets to a certain prosperity. The driving force of the first industrial revolution was not the coal, but the idea of using coal in a certain way. "

Translated from J.D. Sachs: Das Ende der Armut – Ein ökonomisches Programm für eine gerechtere Welt. Siedler-Verlag (2005), S.58. Original: The End of Poverty: Economic Possibilities of Our Times. Penguin Press, New York (2009)



Foto: Sama Shrestha,
CARE Nepal

"Meanwhile, if I am not mistaken, the technology of solar energy made progress, which make them appear possible as the main energy source of the next century. The path S of this study is then, technically, no daydream; and it is socially preferable. I want to stress that this technical judgment is beyond my expertise; I must rely on the opinion of experts herein. Under this assumption, I now stand up firmly committed to solar energy as primary energy source, supported by technically possible energy saving, and against the choice to use nuclear energy as main energy source; nor can I regard fossil fuels for a long term future as an acceptable primary source of energy. "

Starnberg, 30.11.1985

C. F. v. Weizsäcker

Translated from Foreword of C.F. v. Weizsäcker to K.M Meyer-Abich, B. Schefold:
Die Grenzen der Atomwirtschaft. C.H. Beck, München, 2.ed. (1986)

Thank you

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