

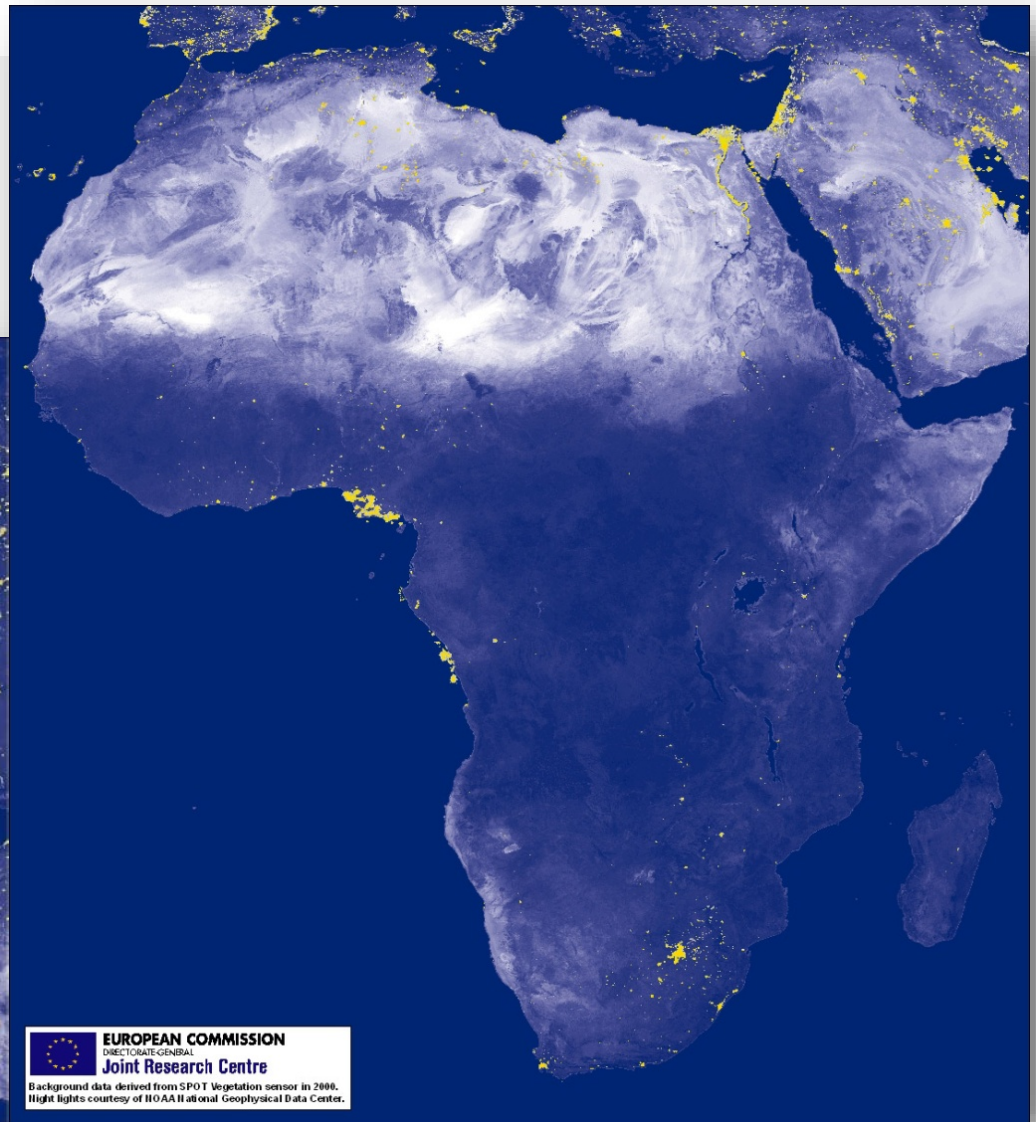
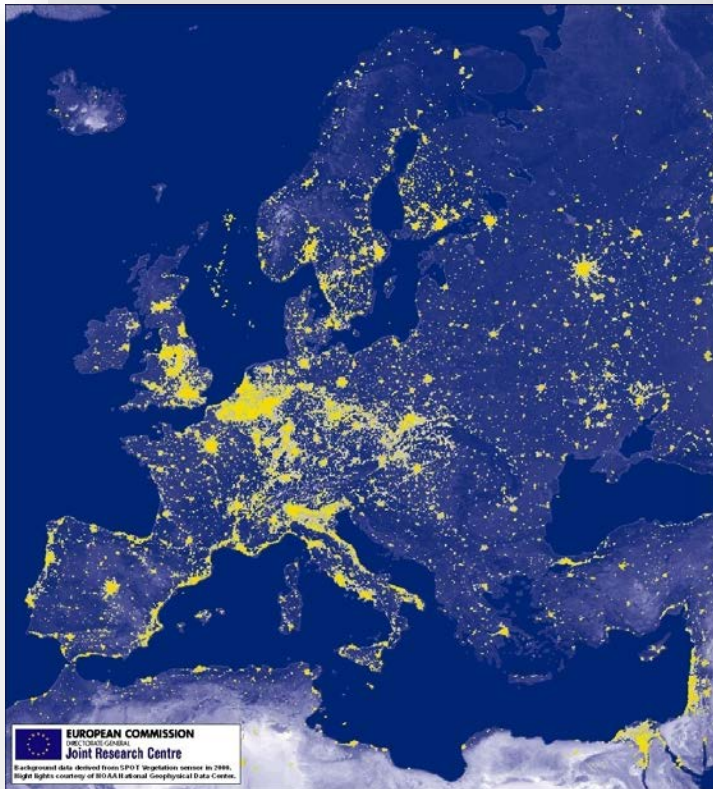


Renewable Energy for Development and for the Poor

*Best Practices of the Austrian Development
Agency (ADA) in the West African and Central
American Region and in Bhutan*

Amb. Brigitte Öppinger-Walchshofer, Managing Director of ADA

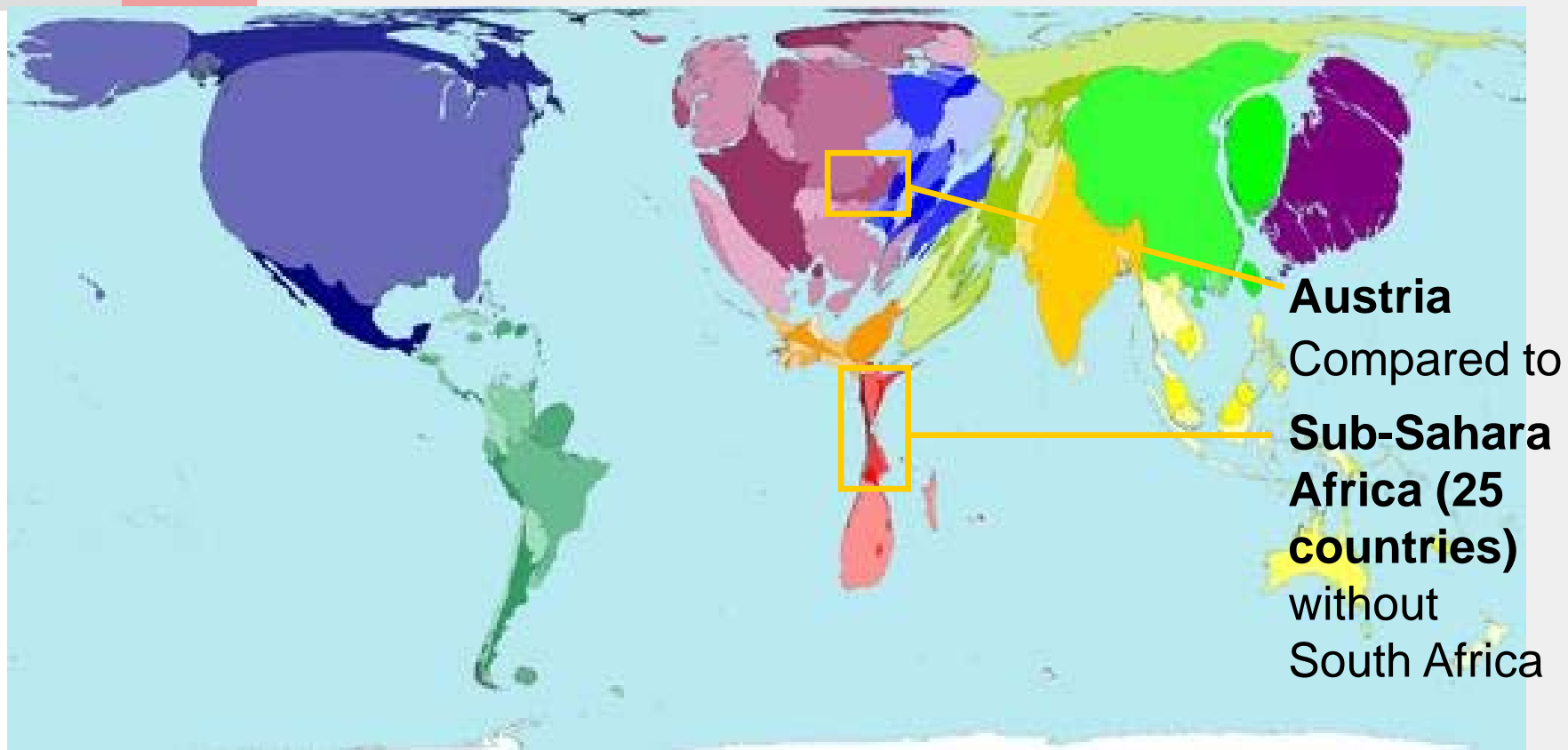
Comparison of Electrification and Gas Flare



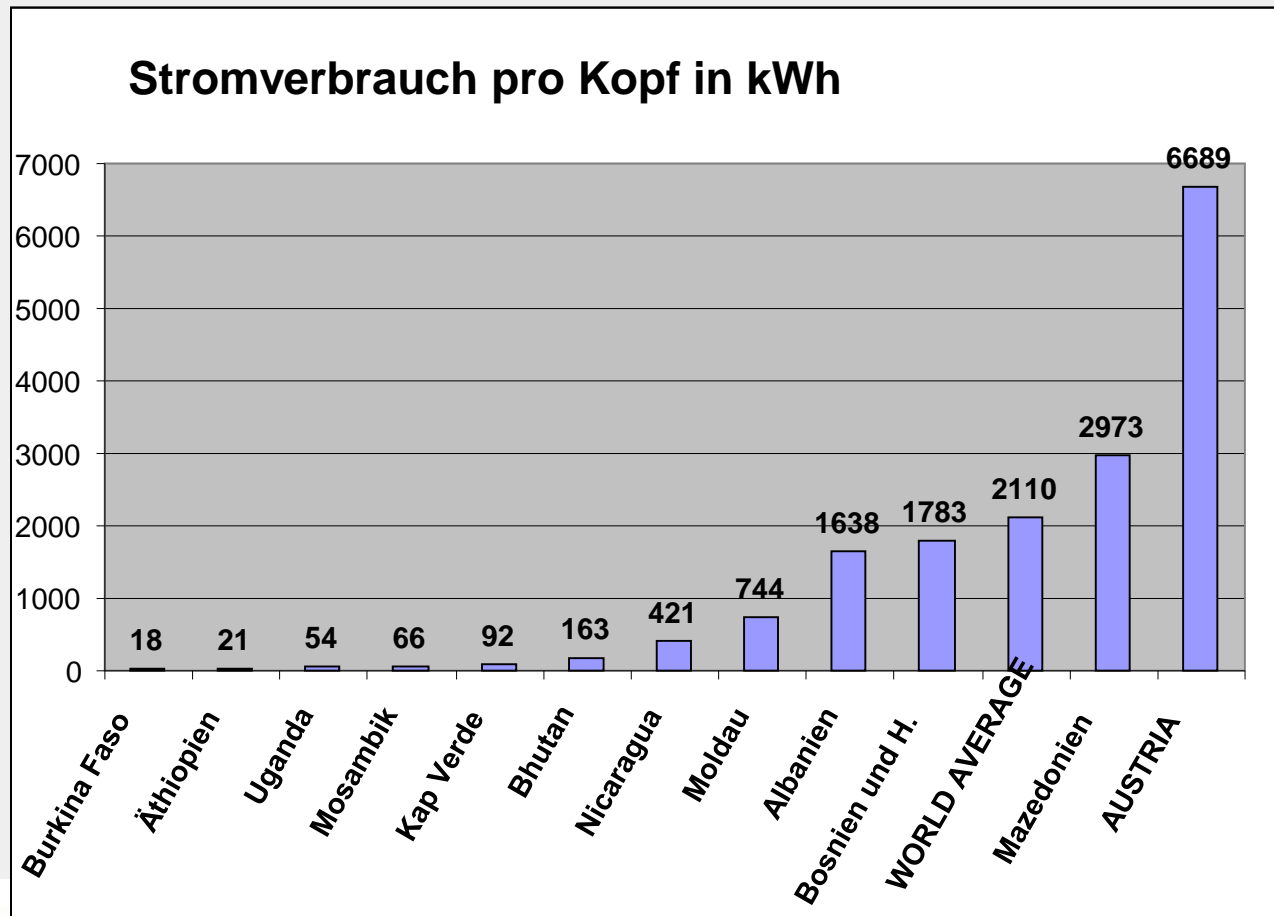
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Power Generation of Countries per capita



Power Consumption in kWh per capita in ADA focus countries



Overall goals of ADA

The Austrian Development Agency/ADA is the **operational unit** of the Austrian Development Cooperation and implements programs and projects to support developing countries in their sustainable social, economic and democratic development.

ADA's main goals:

Reducing global poverty

- Safeguarding peace and human security
- Preserving the environment and natural resources

Sustainable Energy for Development in the ADA

ADA sector “sustainable energy” aims at **affordable access to clean and healthy sustainable energy services** and assists partner countries through

- Using their local energy potentials in a sustainable way
- Analyzing and removing barriers against renewable energy
- Strengthening political framework & the environmental awareness
- Offering Capacity building and training
- Know-how and technology transfer
- Pilot projects

GFSE - global forum on sustainable energy - is a multi-stakeholder platform which is facilitating international dialogue and very fruitful exchange of ideas on energy for sustainable development.

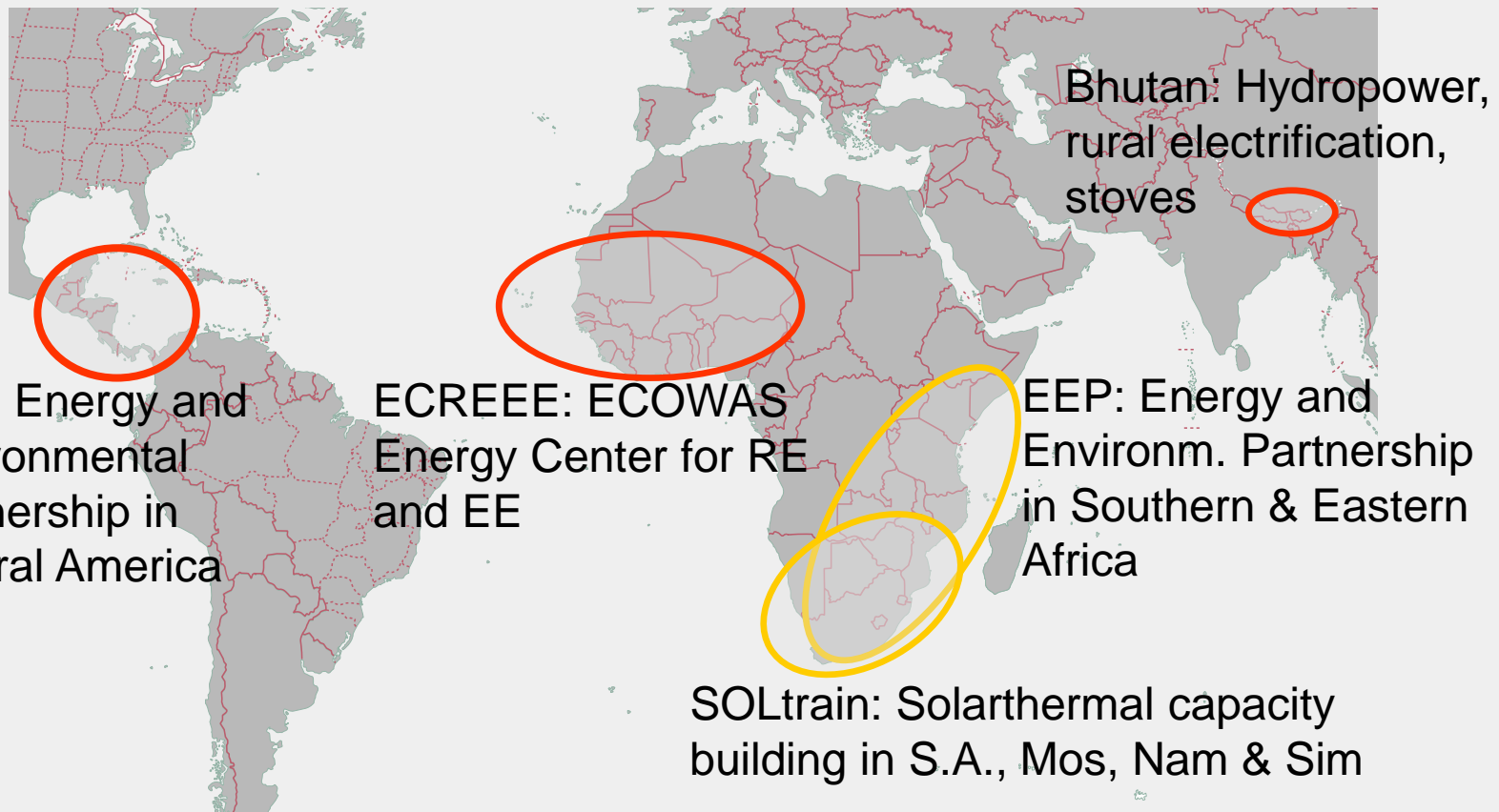
GFSE took place every year since 2000 and initiated various energy activities.

Energy Access and Millennium Development Goals

There is no MDG on energy, nonetheless access to modern energy services is a precondition for achieving the MDGs:

- UN-SG Ban Ki-moon in October 2011 in Oslo:
 - 2012 named International Year for Sustainable Energy for All
 - called for a global clean energy revolution that makes energy available and affordable for all

Map of renewable energy programs of ADA



Hydro Power Sector in Bhutan

Why hydro power sector in Bhutan?

- Bhutan is one of the 48 least developed countries (LDC)
- Water resources excellent
- Deforestation increasing
- Hydro power one of the most promising sectors (besides tourism)

1989: Bhutan becomes priority country for ADC

1990: Bhutan requested support from Austria for HPP and rural electrification

Present goals of Bhutan:

- Power supply for the whole population by 2013
- Increasing income for development by exporting electricity to India

Map of Bhutan



Hydro Power Plant Basochhu in Bhutan

The 64 MW cover 40% of present electricity needs of Bhutan.

ADA contribution: 18.9 Mio EUR for:

- Planning and Construction of the hydro power plant (HPP)
- Technical advice and capacity building measures



Foto © by Christian Mazal

HPP Basochhu is the first plant exclusively operated and controlled by Bhutan experts.

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Hydro Power Plant Basochhu in Bhutan




ADA contributed to capacity building of Bhutanese to train further staff to maintain and control future power plants (ownership).

Electricity is also exported to India to increase the budget of the Bhutan government dedicated for development (education, hospitals)



Opening of the upstream station: 2002
Opening of the downstream station: 2005

Partner of ADA in Bhutan:
Ministry of Finance,
Royal Government of Bhutan,
Department of Energy / Ministry of Trade and Industry

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Hydro Power Plant Dagachhu in Bhutan

ADA initiated this run-of-river power station (114 MW) and supported

- the project development as well as
- the construction by Austrian Know How
- the technical assistance and training of the operating staff for construction leadership
- the carbon development mechanism (CDM) training for Bhutan public authorities



Hydro Power Plant Dagachhu in Bhutan

Investment for Dagachhu: 152 Mio EUR:

- 1/3 equity capital of Bhutan
- 1/3 by Asian Development Bank
- 1/3 by credit financing of the Austrian Kontrollbank (OeKB)
- only 2% grants of ADA for technical assistance



Dagachhu is part of the Clean Development Mechanism (CDM) of the Kyoto Protocol and will generate CO₂ certificates (UNFCCC acknowledged)

Construction phase: 2009 – 2013



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Rural Electrification in Bhutan

Status quo: Health problems and deforestation:

Traditionally a rural household depends on firewood for cooking, the use unhealthy open ovens and kerosene lamps for lighting.

With electricity the people can:

- Cook in rice cookers
- Use water boilers
- Electric lighting
- Be offered better conditions for rural education
- Be offered better conditions for health services

In addition the families get more conscious to install chimney stoves and use liquid petroleum gas (LPG) for cooking.

ADA continues contributing to the Rural electrification in Phobjikha Valley

Implementing Agency: Bhutan Power Corporation Limited

Environmental Monitor: Royal Society for Protection of Nature (RSPN)



Phobjikha Valley at 3000m

Lessons learned in Bhutan's energy sector

Successful development of Austrian - Bhutan cooperation for HPP:

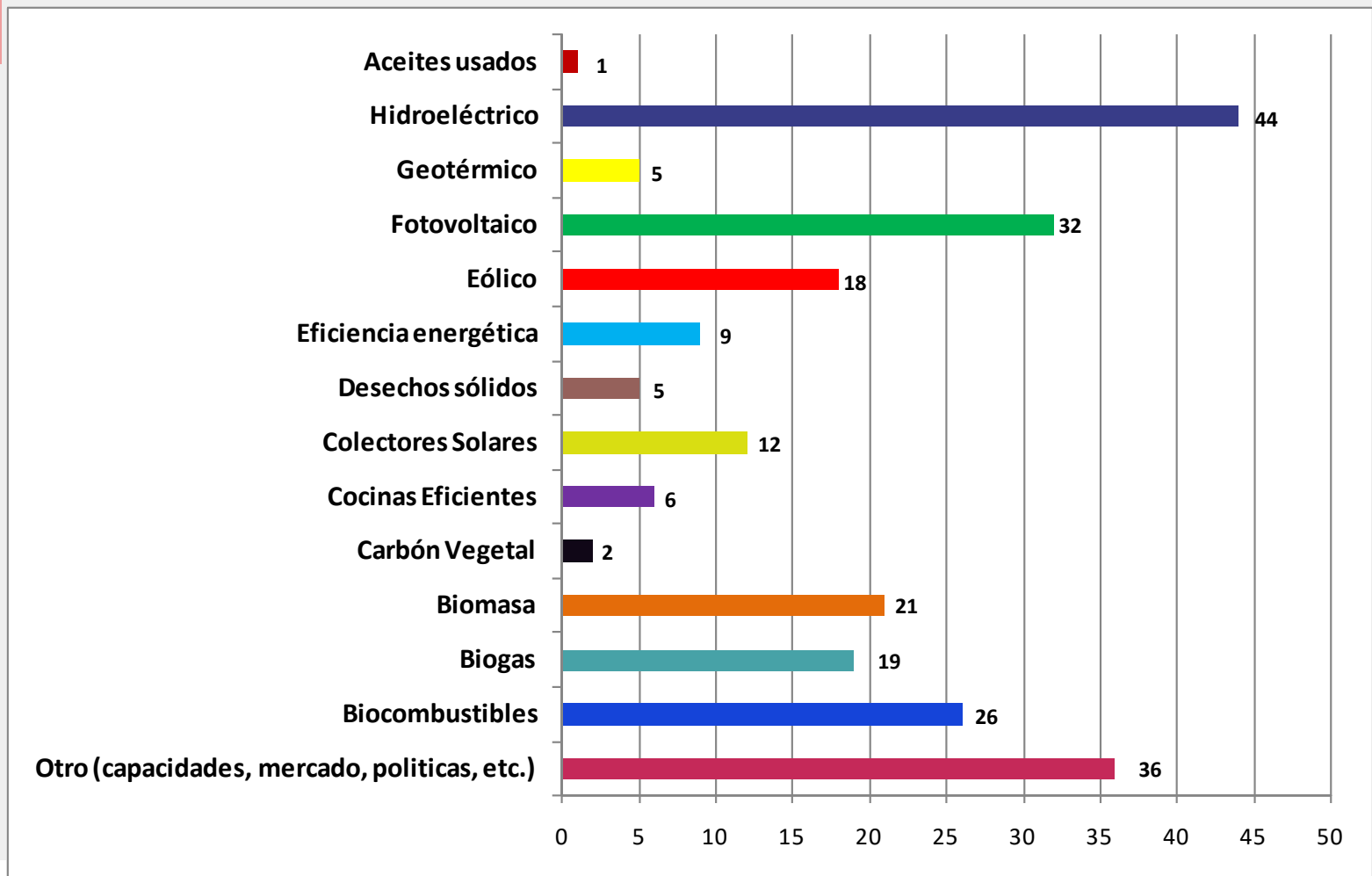
- 1992: ADA grants financed 1st HPP Rangjung (2,2 MW)
- 1995 – 2005: Soft loans financed 2nd HPP Basochhu (64 MW)
- 2009 – 2013: Commercially financed 3rd HPP Dagachhu (114 MW)
- Bhutan developed options for commercially financed hydro power plants
- Bhutan owns the capacity for existing & future power generation by HP
- Export of hydro power main income source for government

EEP: Energy and Environmental Partnership with Central America

- ADA, Finland and (in delegated cooperation) the EC finance the regional organisation SICA to initiate and implement pilot projects and feasibility studies in 8 countries of Central America
- All 8 energy ministries involved in evaluation and project discussions
- 269 projects in 8 countries financed (pilot projects and feasibility studies for use of different sources of RE and measures to achieve EE)
- Overall Budget: 12,4 Mio EUR
- Partners: SICA/Central American Integration System
- Collaboration with governmental institutions, NGO's and private sector
- Start: 2002

Project types of the EEP with Central America

Focus on hydro power, PV & Biomass – weak demand for other RE options



EEP examples of different RE solutions



Biogas Costa Rica la Granja de Cerdos



Jatropha curcas, Biodiesel, Guatemala



**Hydro Power Plant El Bote –
Nicaragua**



**Efficient cook stoves
El Salvador/ Guatemala/ Honduras**

Lessons learned of the EEP

- **EEP model replicable:** ADA and Finland also cooperating in an EEP in Southern & Eastern Africa
Further EEPs in Indonesia 2009, Mekong River 2010 & Andes, 2011
- EEP demand driven - therefore **strong ownership** of the **projects**
- **Ownership of the program should be strengthened**
- Wide portfolio of investment projects promoting the adoption of a variety of RE sources and means to increase EE
- Demonstrated **practical feasibility** in the Central American context
- **Increased awareness of renewable energies** as an option, and brought together a broad range of actors – including high level decision makers - to discuss these issues.
- **Focus on hydro power, PV and Biomass** – weak demand for other RE options
- Less effective in achieving some broader objectives related to policy, legal and institutional issues

ECREEE: ECOWAS Centre of Renewable Energy and Energy Efficiency in West Africa

- Initiated by Austria, ECOWAS and UNIDO
- ECREEE is an operative ECOWAS centre since 2010
- Participation of all 15 ECOWAS countries and energy ministries
- Main activities
 - Capacity Development: training, institution building, awareness
 - Legislation and policy development for sustainable energy
 - Stimulation of the use of renewable energy
 - Reduction of barriers against renewable energy and energy efficiency
- Overall Budget of 29 Mio EUR funded by:
 - Committed Funds: ECOWAS Commission, AECID/Spain, ADA/Austria, UNIDO, Gov. Cape Verde, European Commission, GEF projects
 - Expected Funds: EC EDF

ECREEE - Renewable Energy Facility started

Start of the ECOWAS Renewable Energy Facility in 2011, modeled on EEP in Central America:

1st Call for bottom-up sustainable energy solutions in rural areas

- ECREEE attempts to keep balance between needs of the countries and different energy technology solutions
- 166 concept notes handed in for grants of 7 Mio EUR from all ECOWAS countries
- 55 concept notes selected in all 15 countries for elaboration of full proposals

2nd Call concerning micro finance and micro credits is in preparation

ECREEE - Achievements in 2011

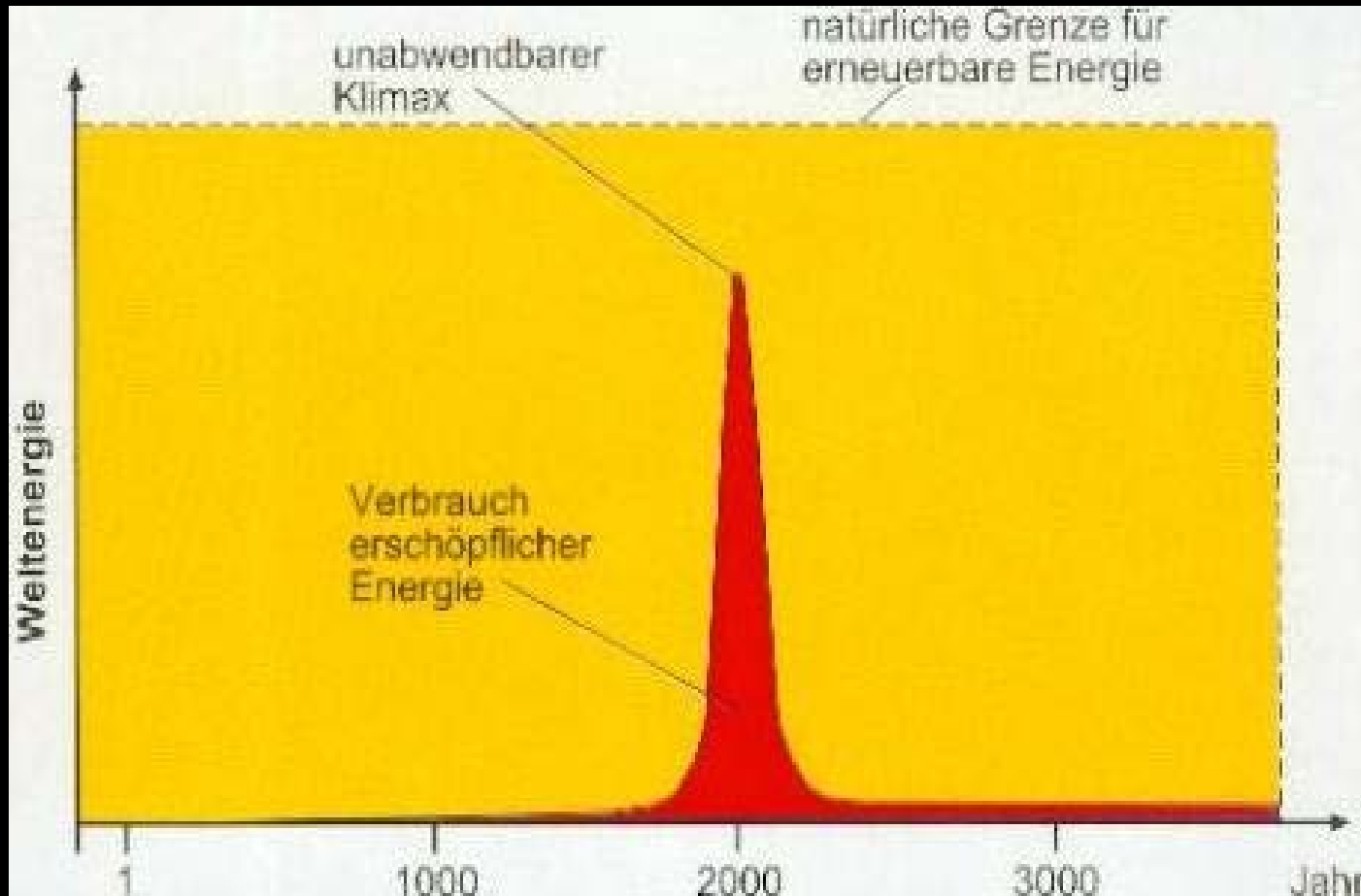
- ECOWAS Solar and Wind Resources Assessment launched
- Preparations for a regional concentrated solar power plant launched e.g. in Mali, Niger, Burkina
- Regional capacity needs assessment launched in cooperation with West African universities
- Finalized the planning for the ECOWAS Observatory for Renewable Energy and Energy Efficiency for energy potentials for investors
- Concept for the ECOWAS Renewable Energy Investment and Business Initiative: KFW agreed to host the first Forum in Frankfurt in 2012
- RE & EE policy papers progress, financed by EC
(to be approved by 15 countries in regional GFSE forum 2012 in Ghana)

Lessons learned of ECREEE in West Africa

- Effective in achieving broader objectives related to policy, legal and institutional issues (more effective than the EEP)
- Top down and at the same time bottom up approaches more successful for RE and EE policies
- ECREEE's activities at the international, regional and national levels begin to succeed in strategic, political and practical impact
- 1st Call shows strong focus in photovoltaic off grid and Biogas proposals
- More awareness raising for other renewable energy solutions necessary
- Active part of ECREEE from the beginning crucial to get international visibility and access to different kind of funds for the West African region
- Regional policy papers in elaboration: Stocktaking and reviewing of RE and EE options in all 15 countries financed by EC projects
- Regional approach important as countries learn from each other

Fossile Energy Use in Mankind History

Solar and renewable energy in future available
whereas fossil energy limited



Overall lessons learned

- **Regional cooperation useful and even more effective using bottom up (demand driven) and top down (strategical, political and funding) approaches**
- **GFSE Forum on a regular basis: Information exchange on a regional and global level facilitates international dialogue and programs on sustainable energy**
- **Focus on local, national and regional potentials of renewable energy and energy efficiency solutions can address the energy needs of the population**



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EEP: www.sica.int/energia

ECREEE: www.ecreee.org



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