



UNU Geothermal Training Programme

United Nations University Geothermal Training Programme and Capacity Building in the East Caribbean Region

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High-Level Roundtable in Caribbean SIDS 25-27.03.2008



United Nations University

- Established in 1975
- Headquarters in Tokyo
- International community of scholars
- Think-tank for the United Nations system
- Builder of capacities, particularly in developing countries
- Several UNU Research and Training Centres and Programmes around the world
- The UNU Geothermal Training Programme has operated since 1979

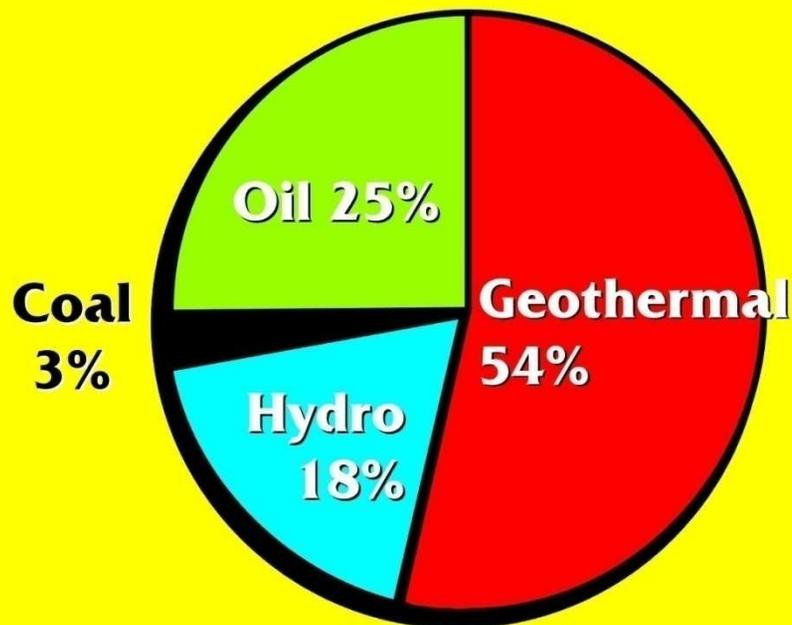


Geothermal energy

- A clean, renewable and environmentally benign energy source based on the heat in the earth
- Utilized in 73 countries of the world (official records), known in over 90
- Electricity generation 57 TWh/a in 24 countries (2004)
- Direct use amounts to 73 TWh/a in 71 countries (2004)
- Geothermal is number three of the renewable energy sources in world electricity production after hydro and biomass, followed by wind and solar energy
- The technical potential of geothermal energy in the world is very high

Why in Iceland ??

Total Primary Energy Consumption in 2003



- 90% of houses in the country are heated by geothermal
- Geothermal power plants with an installed capacity of 452 MWe (2007) provide for 25% of the electricity
- Other uses include greenhouses, fish farming, industry, snow melting, swimming pools etc.
- Only a fraction of the potential is used



UNU Geothermal Training Programme

United Nations University Geothermal Training Programme

- .. aims at assisting developing countries with geothermal potential to build up or strengthen groups of specialists in most aspects of geothermal exploration and development
- .. offers annually six months specialized training courses for professionals in geothermal work in nine different lines
- .. offers further studies to MSc. education in cooperation with the University of Iceland
- .. opens for a PhD. education in 2008 also in cooperation with the University of Iceland
- .. offers workshops and short courses that are held in the developing countries and can take 1-4 weeks



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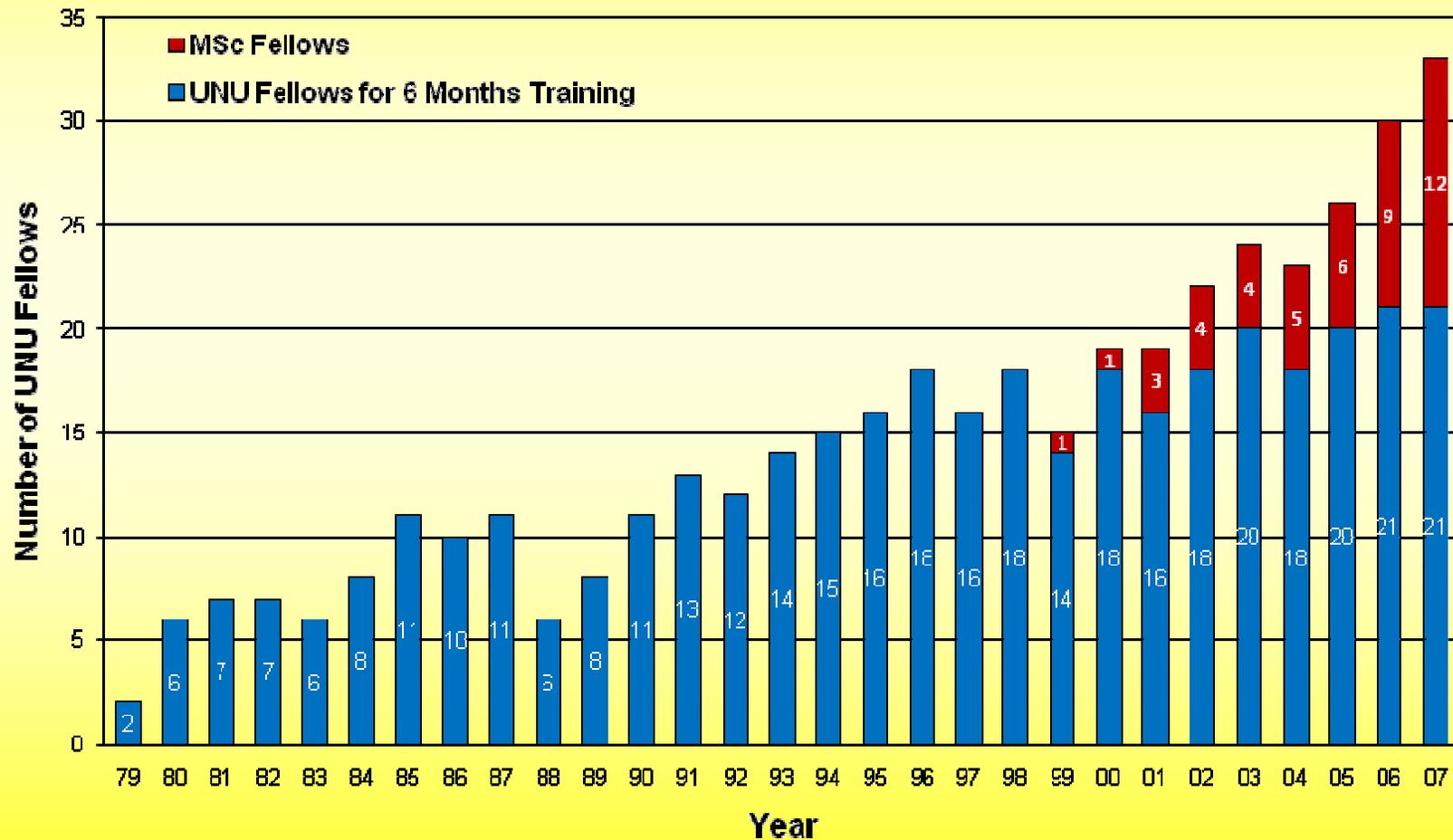
Geothermal training

- It is intended to provide participants with the ability to carry out independent execution of projects at home
- The 6 months courses, given in 9 different lines of specialization, include introductory lecture course, specialized training with lectures and practicals and carrying out of projects with report writing
- Fellowships are awarded to developing countries and some countries of Central and East Europe and are mainly financed by the government of Iceland
- Candidates are selected by interviews during site visits to the recipient countries by staff members, and must speak English
- They must have a university degree and some experience, if possible, and come from governmental energy or research institutions
- Fellowships for MSc studies are offered to the best students, and PhD Fellowships are now also available



UNU Geothermal Training Programme

Fellows completing 6-months courses and MSc students 1979-2007





UNU Geothermal Training Programme

**6-months
class of
2007**

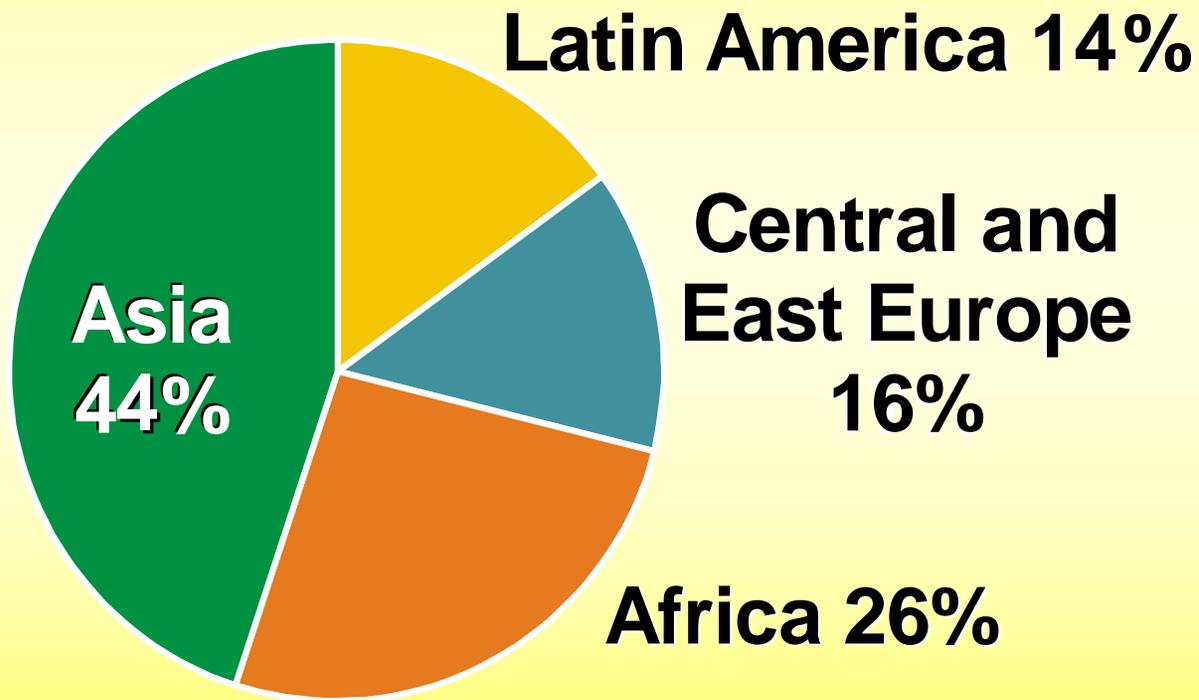


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Participation

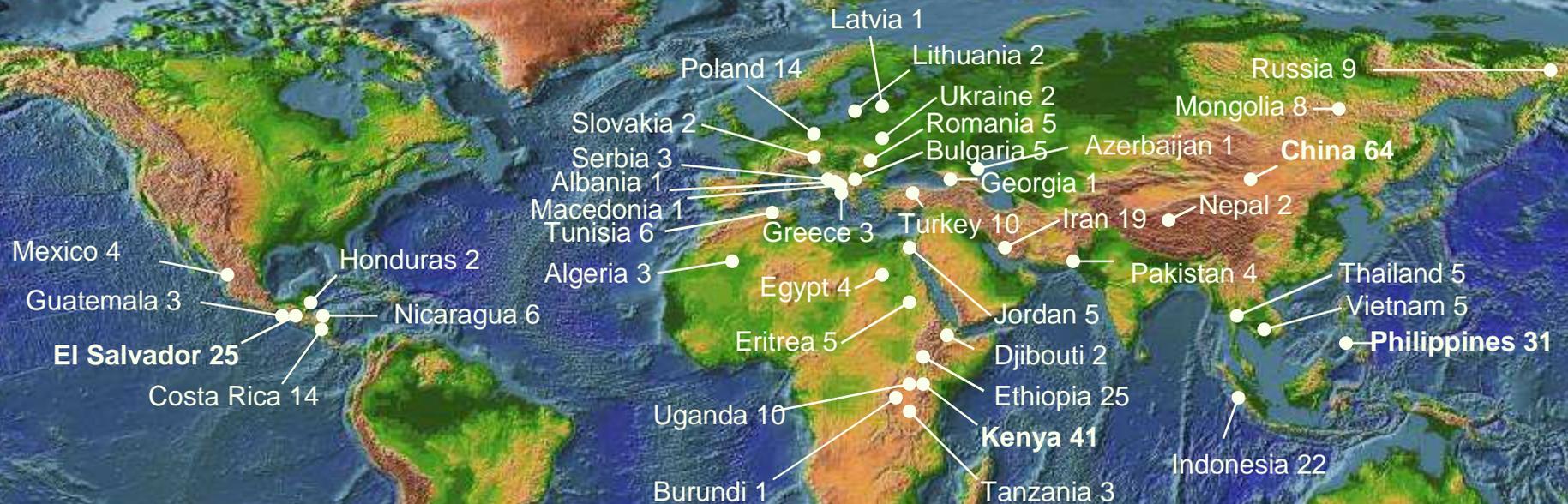


- During 1979-2007, 380 scientists and engineers from 41 countries have completed the 6 months specialized courses
- Thereof 62 women (16%)



UNU Geothermal Training Programme

Fellows of the UNU Geothermal Training Programme in Iceland 1979-2007





UNU-GTP graduates

- .. are among the leading specialists in geothermal research and development in many countries in Africa, Asia, Central America and Eastern Europe, and some have become world authorities in their field
- .. have contributed significantly to renewable energy development in their parts of the world
- .. are very active in the international geothermal community



UNU Geothermal Training Programme

World Geothermal Congress 2005

77 (104) UNU Fellows from 25 countries presented 141 papers



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UNU-GTP – Short courses

- As a contribution to UN's Millennium development goals the Government of Iceland's has financed short courses in geothermal training held in various continents
- Started in East Africa with the "Workshop for Decision Makers in Geothermal" – held in Kenya in 2005 cooperating with a.o. KenGen and UNEP/GEF
- In 2006 and 2007, this continued with "Short Courses on Surface Exploration of Geothermal Resources", to be continued in 2008
- In 2006 similar series were started in C-America with the "Workshop for Decision Makers" in El Salvador and in 2007 with "Short Course on Geothermal Development", to be continued in 2008
- In May 2008 new series starts in Tianjin, China for Asia, focussing on LT utilization, and in 2009 one more series on HT development is expected to start in Indonesia also for Asia



UNU Geothermal Training Programme

Workshop for Decision Makers on Geothermal Projects in Central America, El Salvador 2006



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Training of Latin-Americans and their specializations

	Costa Rica	El Salvador	Guatemala	Honduras	Mexico	Nicaragua
Geological Exploration	2	1			1	
Borehole Geology	2	1	1	1		
Geophysical Exploration	2	2		1	1	
Borehole Geophysics		2				
Reservoir Engineering	2	5	1		2	3
Chemistry of Fluids	2	4	1			2
Environmental Studies	2	3				1
Geothermal Utilization	2	4				
Drilling Technology		3				
Total	14	25	3	2	4	6



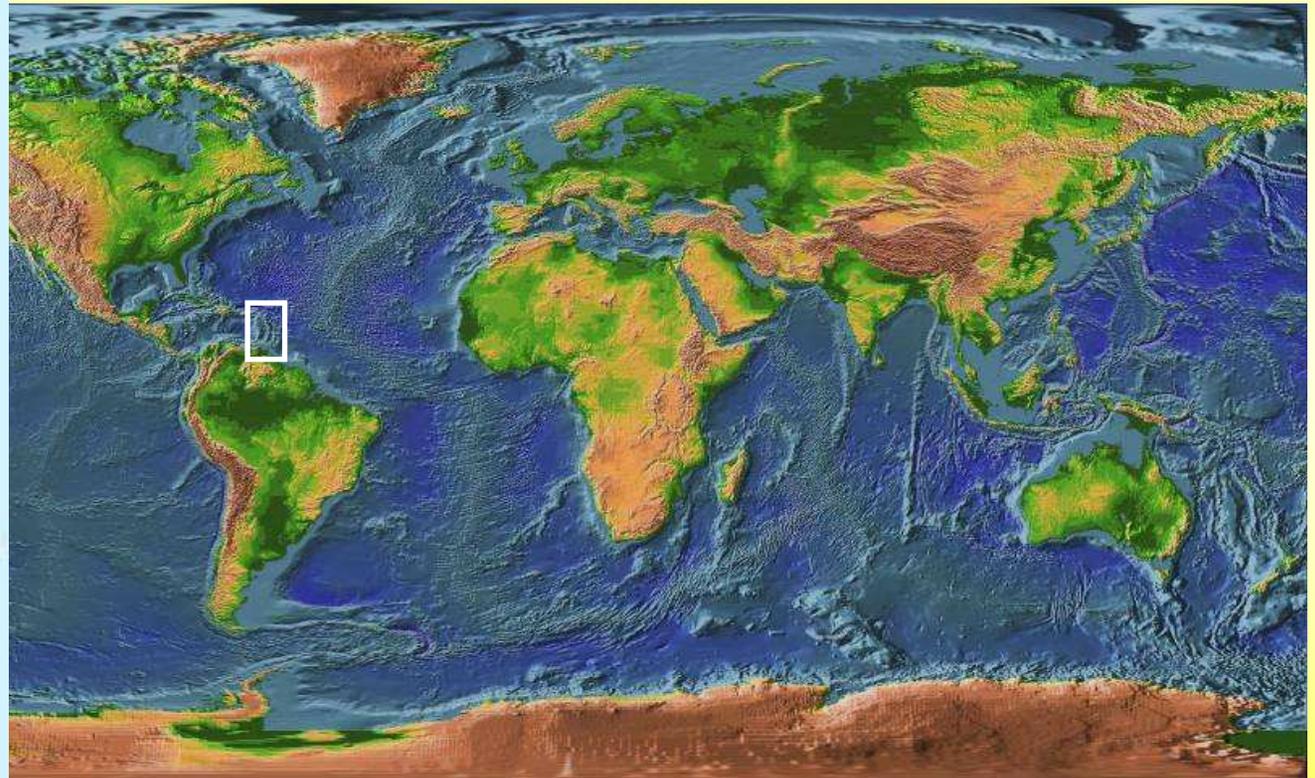


Geothermal electricity production 2004 Top 15 countries

	GWh	% of national electricity		GWh	% of national electricity
USA	17,840	0.5	Costa Rica	1,145	15
Philippines	9,419	19	Kenya	1,088	19
Mexico	6,282	3	El Salvador	967	22
Indonesia	6,085	7	Nicaragua	271	10
Italy	5,340	2	Guatemala	212	3
Japan	3,467	0.3	Turkey	105	
New Zealand	2,774	7	Guadeloupe	102	2
Iceland	1,406	17			

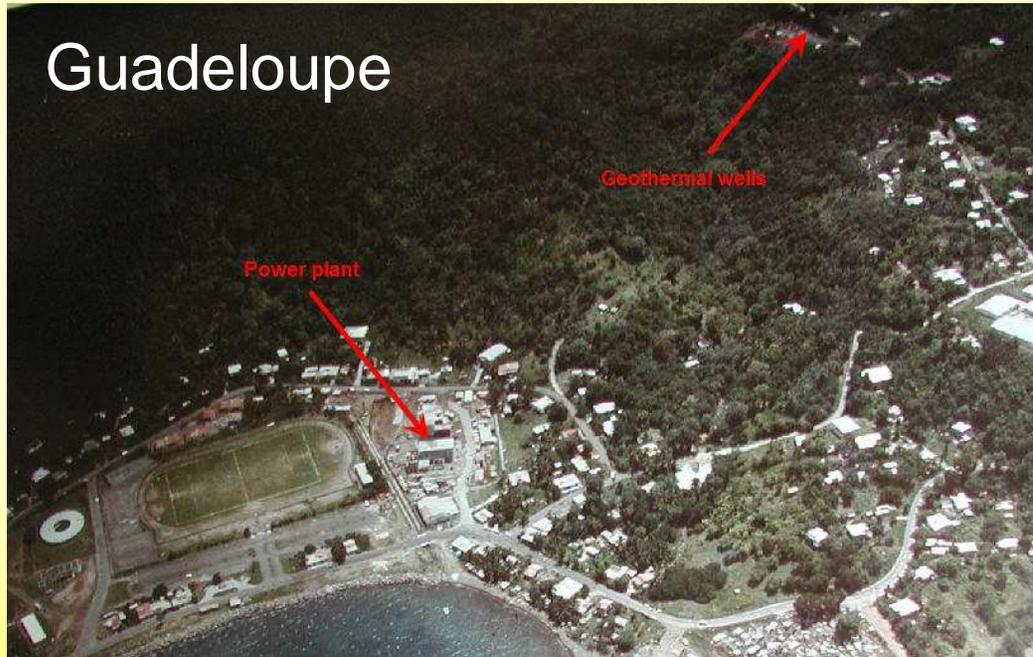


Geothermal Potential in the Caribbean SIDS



Status of exploration

Guadeloupe



- Solfataras and hot springs on many of the islands
- Exploration effort done on some of them in the past
- Drilling in St. Lucia in 1970s and 1980s
- More exploration needed at most locations before drilling
- First Icelandic UN geothermal mission to St. Lucia in 1951



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Capacity building with UNU-GTP

- Six months training in Iceland is open for all Caribbean SIDS that have geothermal resources and an energy policy that aims at utilization of these, and have qualified candidates
- Specific cooperation partners with UNU-GTP such as energy institutions or universities need to be targeted
- Participation in the short courses in Central America is open
- Special short courses designed for the Caribbean SIDS possible if demand and active energy politics make that viable
- Fellowships for MSc studies in Iceland open for candidates who have done well during the 6-months training



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Geothermal future in the Caribbean



- Geothermal energy can play an important role in the Caribbean SIDS area
- Geothermal as a renewable energy resource is the energy of the future
- The geothermal prospects are there to be utilized
- Training of geothermal scientists and engineers is needed and we are offering that



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**Thank
you for
the
attention**



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