

“Energidagene NVE 2009”

**The Way Renewable Energy
Development can deliver on the
Climate Change Agenda
Case Tanzania**

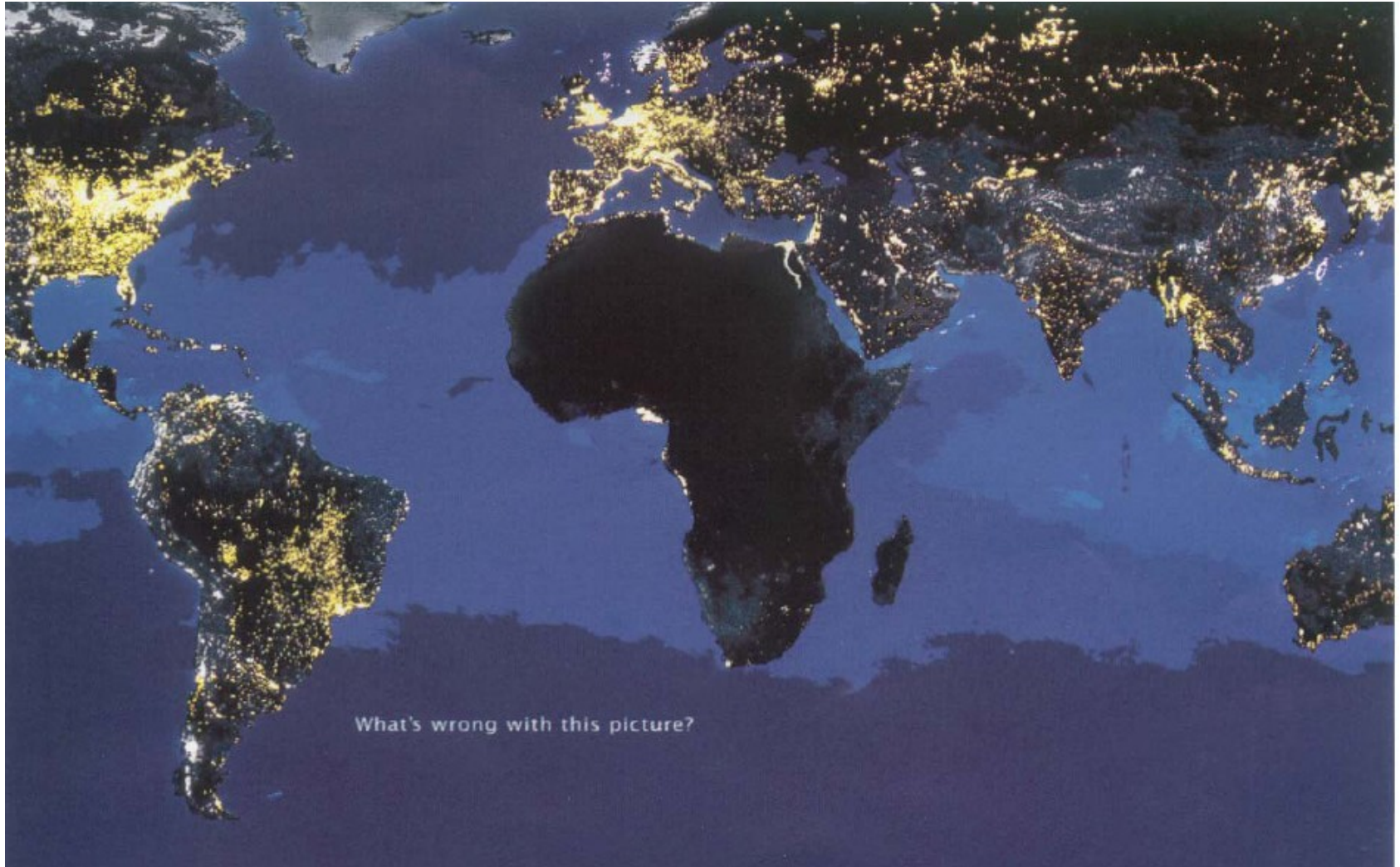
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Royal Norwegian Embassy, Dar es Salaam

October 2009

Contents

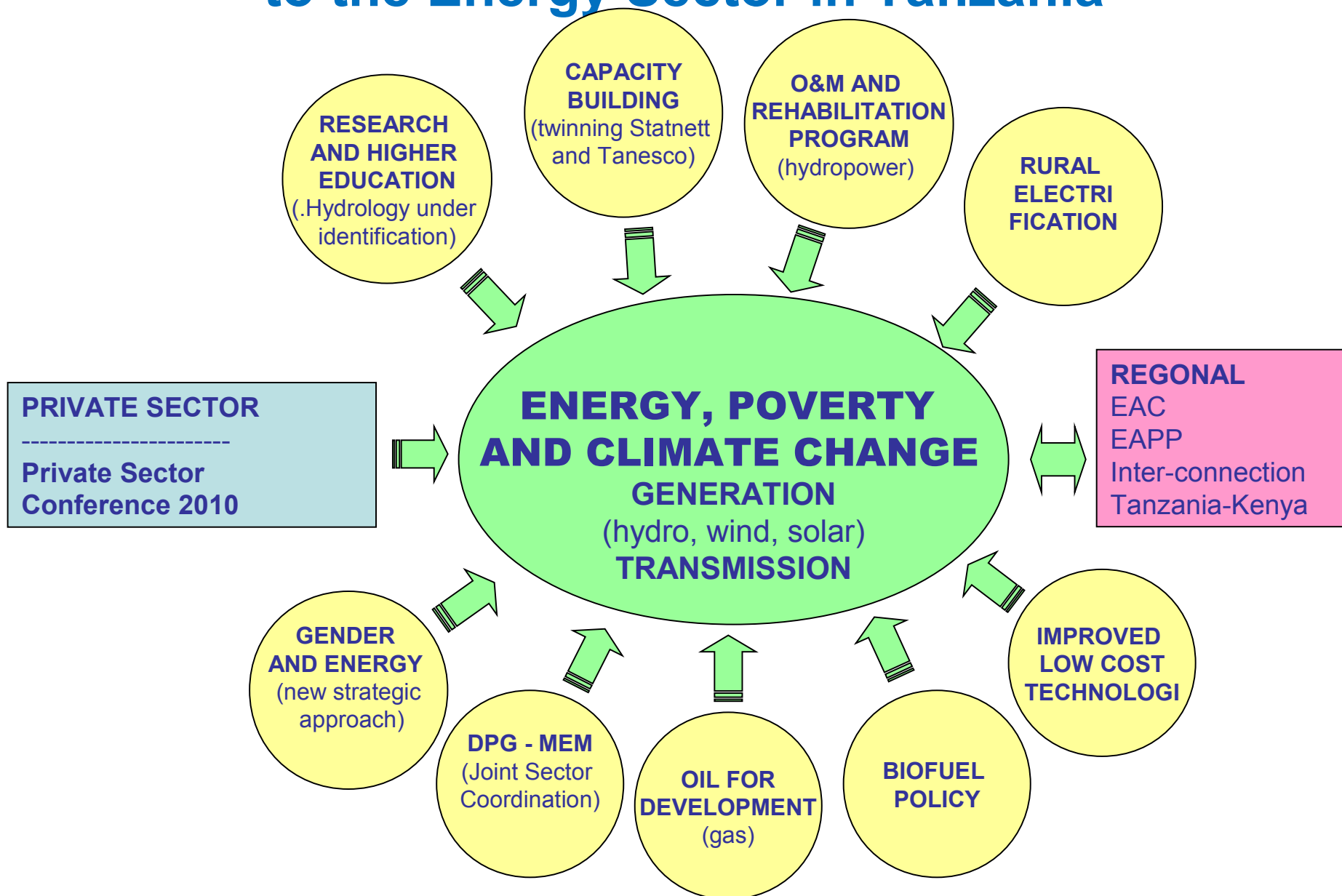
- Tanzania – Norway; a New Energy Programme
- Challenges in Energy Sector Tanzania
- New Initiatives / Projectes
- Conclusions
- Recomendations



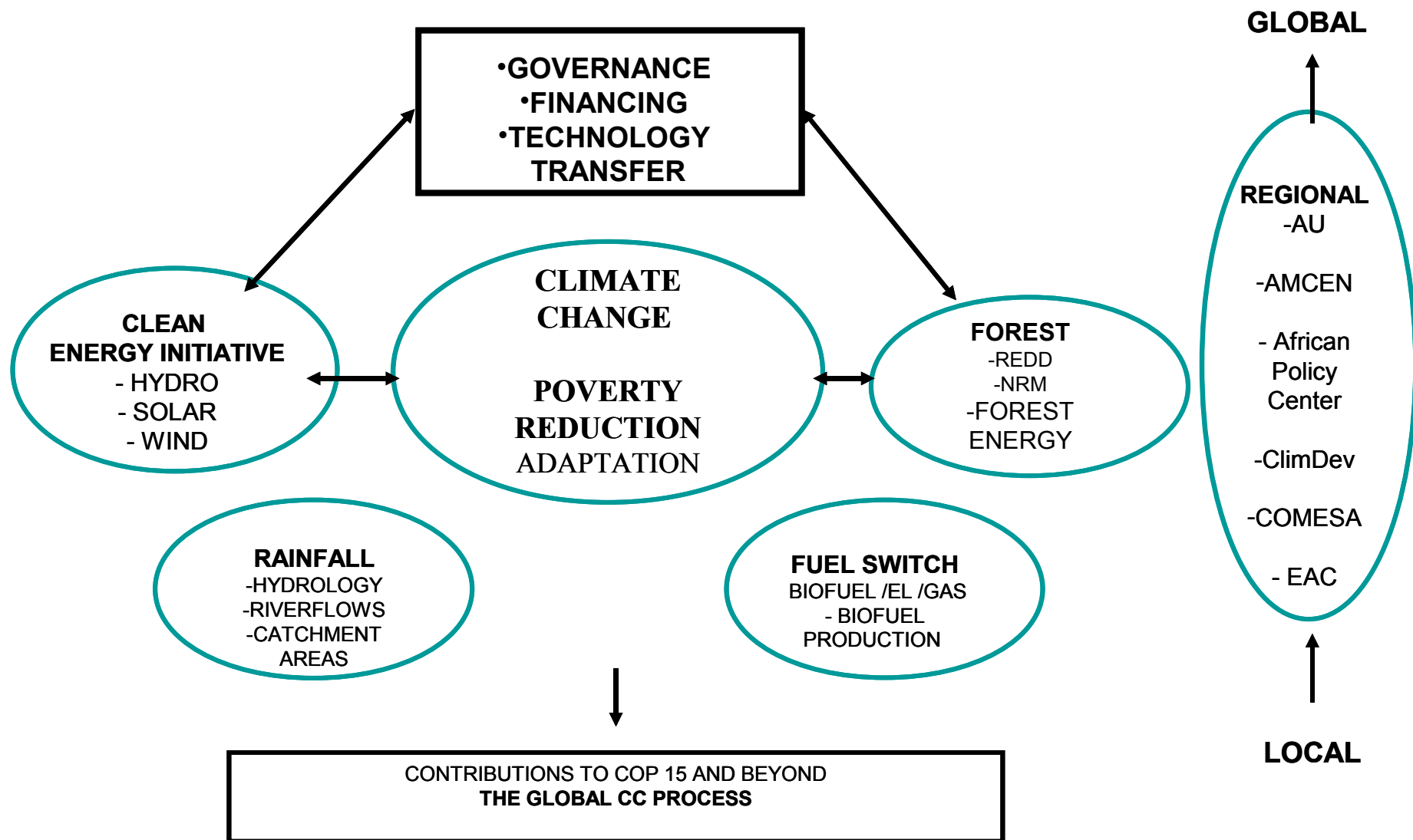
What's wrong with this picture?

“It is the world’s poorest who are most vulnerable to the consequences of the climate change”, says Norway’s Minister of the Environment and Development Cooperation, Erik Solheim (SV). 22/10/2007

The Clean Energy Initiative: Norwegian Support to the Energy Sector in Tanzania



The Climate Change Agenda - A Cross Sectoral Responsibility (Energy - Forest)



Background

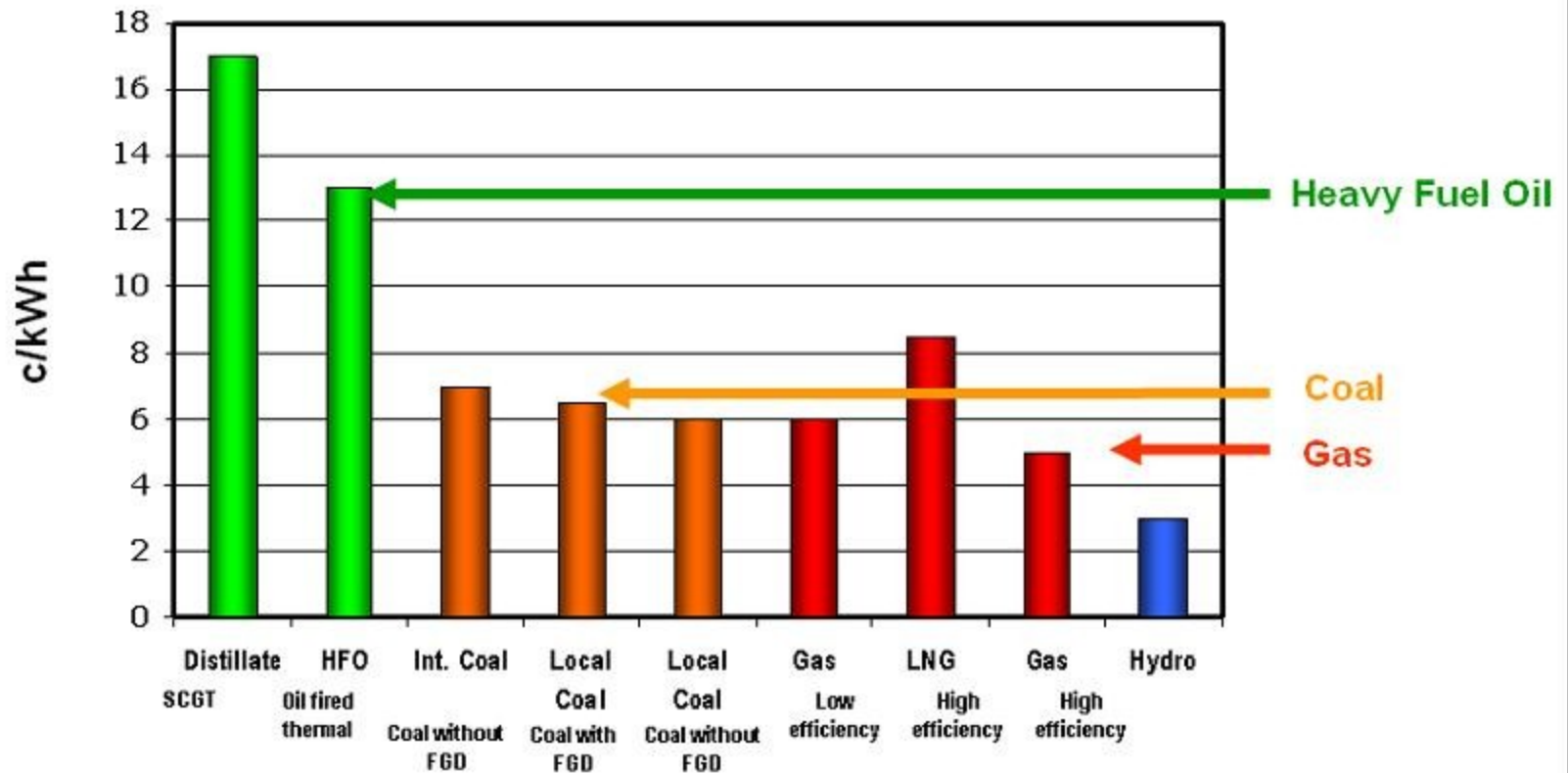
The transmission and distribution system is rundown. Around 33% of power generated is lost due to transmission and distribution losses and theft.

Power Sector Performance Indicators (Source: TANESCO 2008)

YEAR	2004	2005	2006	2007
Peak Demand (MW)	508.65	552	603	660
Installed capacity (MW)	911	953	958	1226
Generation (GWh)	3394	3771	3588	4156
Energy transmitted to the Grid (GWh)	3251	3513	3450	4252
Of which Hydro	1998	1765	1424	2632
Of which Thermo	1253	1748	2026	1620
Energy Sales (GWh)	2465	2628	2769	3288
Cumulative losses (as a % of Power generated)	23	28	36	33
Number of customers	606,000	663,000	608,000	629,000
Electrification rate (domestic customers per population) in %	10	10.6	9.8	10

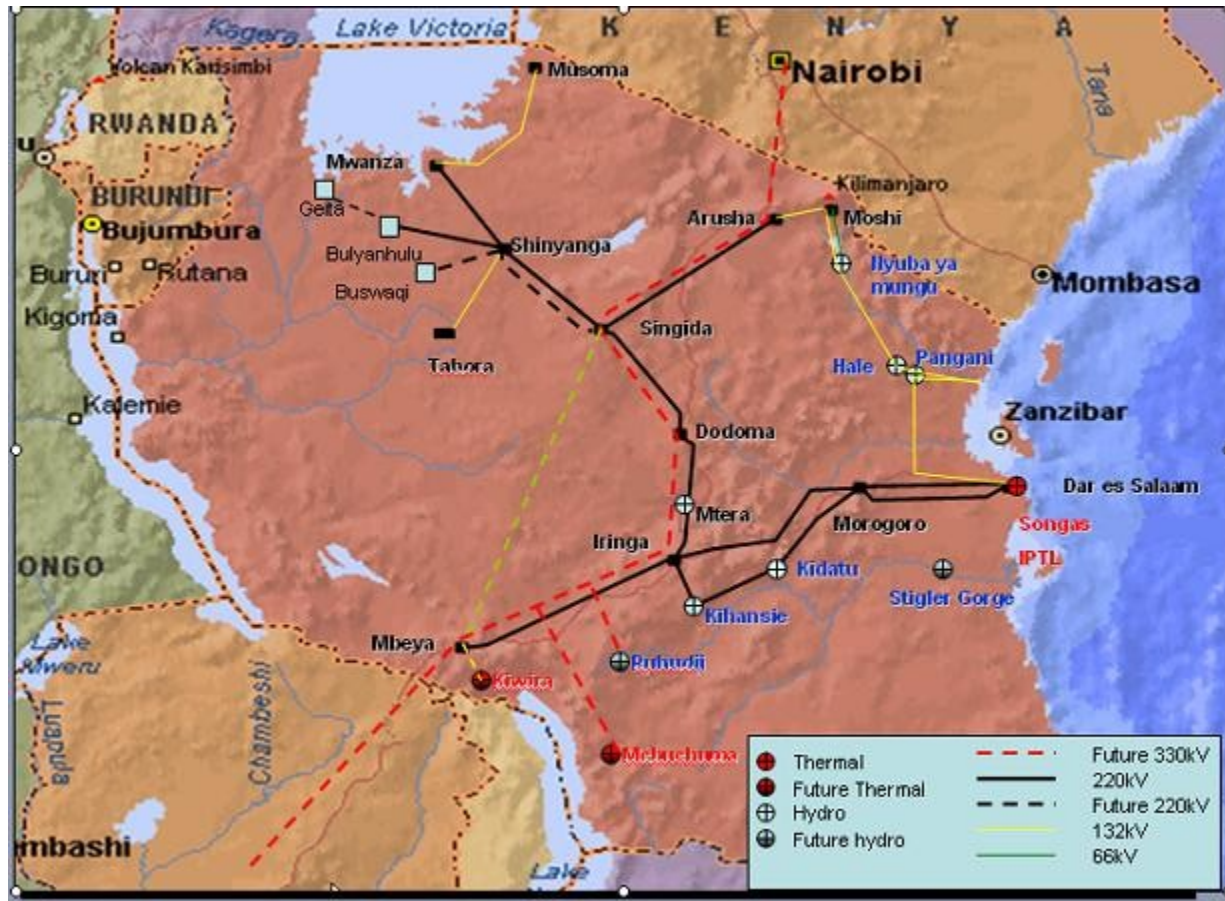
Background

Hydro electricity is the cheapest energy source



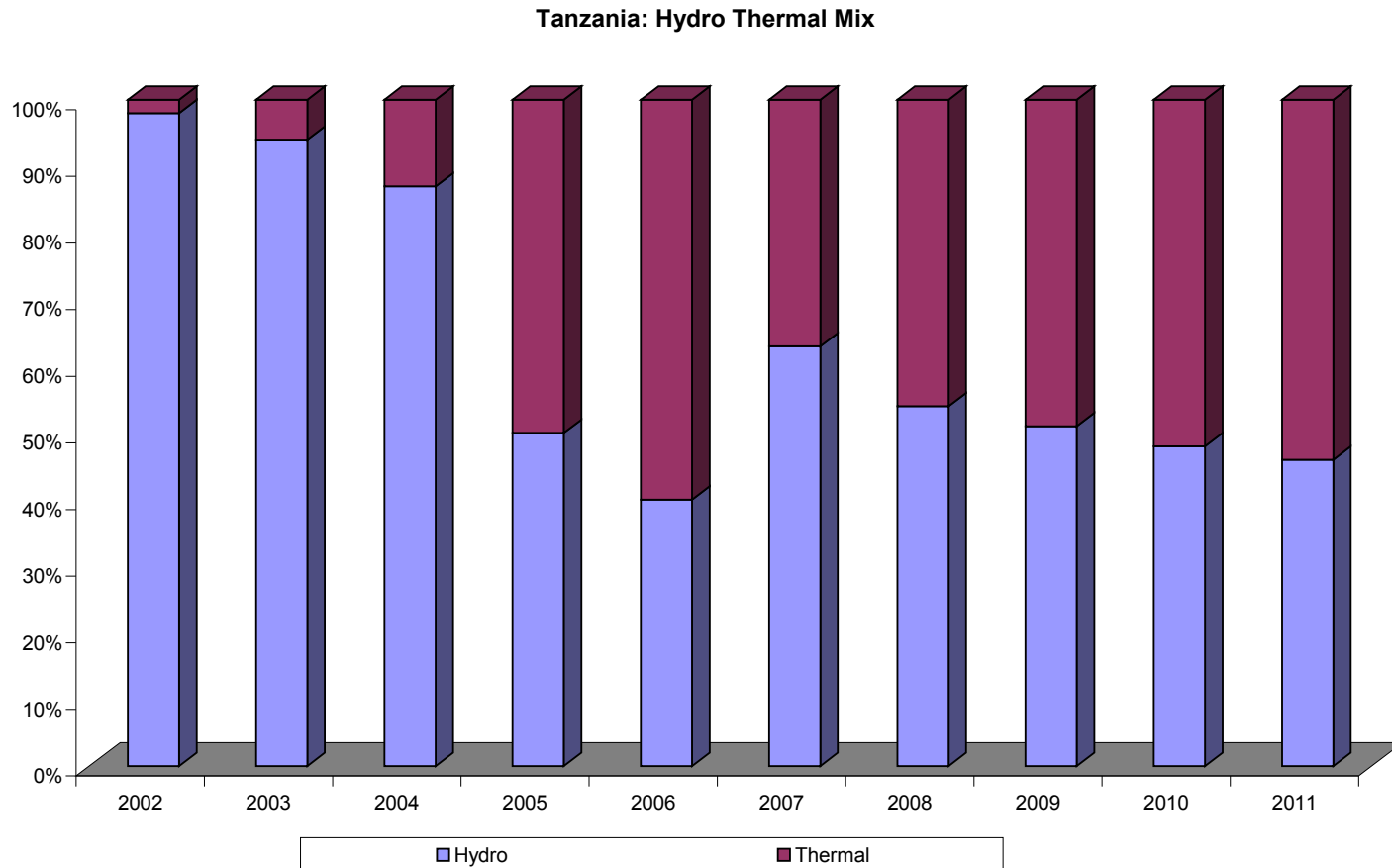
Production in South–Demand in North

Power generation facilities are primarily in the south with the demand centers being in the north, north-west and east. The transmission system is grossly inadequate and prone to system collapse.



Trends – Thermal / hydropower

There has been a steep reduction in the share of hydropower over the last few years. Independent Power Producers (IPP's) provide the bulk of thermal power. Thermal support is critical - especially in drought years as in 2006.



Independent Power Producers (IPP)

Several IPP's supply power to the grid:

- Songas (180 MW) – contracted from 1999 to 2024
- IPTL (100 MW) – contracted from 1995 to 2015
- Kiwira (Coal) (6 MW) and
- Artumas (12MW) which has an Interim Power Purchase Agreement to supply power to Mtwara and Lindi regions.

The Power System Master Plan, has recognized that in Tanzania most new power generation will probably be from privately owned projects, which could include Kiwira (200 MW), Ruhudji HPP (358 MW), Mnazi Bay (gas) (300 MW) and Mchuchuma (coal) (400 MW).

Independent Power Producers

Power from IPP's is high cost due to poorly structured and negotiated agreements as well as due to the fuel mix.

2005: IPP's provided 49% of the generation for 81% of TANESCO revenues.

2006: IPP's provided 59% of the power for 104% of overall TANESCO revenues.

There is need to ensure that future PPA's are negotiated in a more equitable manner than in the past.

The Pemba Sub-Marine Cable – Strategic Electricity Transmission

- **Total project costs: NOK 400 million. Norwegian grant 300 million NOK, Zanzibar/GoT 100 mill NOK**
- **Replaces 3 old diesel generators (4.5 MW capacity) with hydropower**



Rural Electrification Zanzibar

- **More than 20 years and 180 mill NOK (freeze 94-02)**
- **Today more than 80% of the isles able to connect to the grid, more than 20% have access**
- **Institutional, technical and financial challenges for ZECO – next phase focus on safeguard investment and capacity building in cooperation with Sida**

When the power will be more reliable, I plan to start up a tailor business, says Mrs. Maiba Musa from Pemba, a former member of the House of Representatives. She already owns an electric sewing machine, but seldom uses it due to the frequent power cuts.



Renewable Energy Promotion: TaTEDO

- **TaTEDO is the leading agency within promotion of renewable energy technologies in Tanzania. TaTEDO's overall objective is to contribute to poverty reduction and environmental conservation**
- **Support to a project on 'Integrated Modern Energy Services for Sustainable Development and Poverty Reduction'.**
- **Upscale uptake and use of modern biomass energy technologies and services,**
- **Mitigate environmental adverse effects associated with energy production and use,**
- **Increase access to electricity, solar drying and motive power through decentralised energy systems,**

Biofuel

Support to National Biofuel Policy Framework (Sweden/ Norway)



New Initiatives for Generation of Renewable Energy

- **Hydropower Projects – Tanesco** (Feasibility Studies)
 - a) Mpanga (144 MW) – Rufiji River
 - b) Masigira (118 MW) – Ruhuhu River
- **Development of Small Hydropower Projects – Rural Electrification Agency / Fund** (Exploring 4 different sites – 2 to 8 MW)
- **Solar / Small Hydro (private initiatives)**
- **Wind project at Makambako** (50 – 100 MW) (Tanzanian - Norwegian private developer)
- **Solar Water Pumping Kimbiji water supply** (show-case for secondary school - boys and girls)

New Initiatives

- **Emergency Support to Repair of Kihansi Hydropower Plants**
- **Maintenance / Rehabilitation Programme –Tanesco**
- **Capacity Building**
Twinning between Tanesco and Statnett
- **Transmission: Iringa – Shinyanga - "Backbone"**
(Multidonor project)
- **Hydrology**
- **Gender & Energy Initiative**

New Regional Initiatives

- Interconnection Arusha - Nairobi
- Support to East African Community – Energy Secretariat
- Support to Eastern African Power Pool (EAPP)
- Cooperation with African Union (Large Hydro (?))

Conclusions

- The immediate focus of GoT is energy security for the country in a cost effective and sustainable way
- Hydropower is a viable and significant source of energy and not primarily selected due to climate change aspects (a “bonus”)
- Norwegian cooperation follows an Holistic Approach
- Renewable energy development cooperation with Norway is important for Tanzania

Recommendations

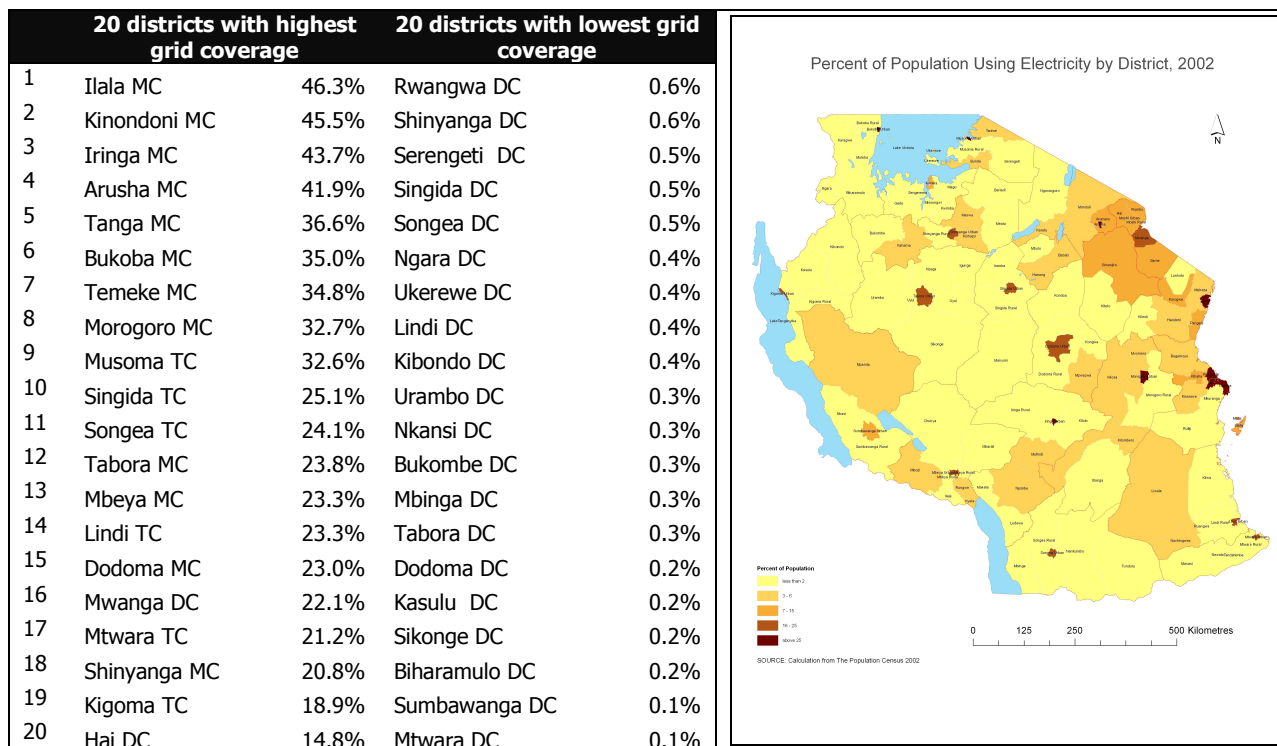
- Need for new tarif structure
- Attract private investments
- GoT provides funding support to immediate implementation of gas power plant
- Maintenance and operation need more focus
- To conclude on Stiglers Gorge.

The Norwegian Clean Energy Initiative

- Better, more secure and sustainable energy access
- Development of renewable energy sources
 - Hydropower (large and mini, micro)
 - Wind, Solar
 - More effective use of traditional energy sources (biomass)
- Transmission and distribution investments
- Public private partnerships for energy generation
- Strengthening of institutions, framework and infrastructure that promotes investments, production and trade
- Regional energy initiatives

Electricity Supply Situation in Tanzania

Electricity coverage in Tanzania is less than 10%. Rural coverage is less than 2%. Even in Dar es Salaam only 50% of households have access to electricity.



Note: These data are from the year 2002. Since that time the number of households connected to the grid has increased by approximately 150-170,000.