Unveiling Clean Energy Infrastructure project
Electrification of entire Africa

- Unveiling Renewable energy Infrastructure for Electrification of entire Africa
- Policy reforms Private-sector-driven Electrification of entire Africa

✓ Donor-Aid: the cancer that has devasted Africa’s initiative, resourcefullness and local industries

Dr. Ifeanyi Amajuoyi
Coordinator, DESERTEC-Africa
President / CEO, Applied Science Solutions Group (Nasset Energy, Naaset Petroleum)
Does Africa really lack investment capital for infrastructure development?

- We do not believe that Africa lacks the investment capital for infrastructural development, like donor agencies and lending institutions would like Africa to believe!
- Misplaced priority rather than lack of fund is the reason for the current crisis in Africa’s infrastructure development and maintenance!
- DÉSERTEC-Africa has strong reservations against current form of aid to Africa due to its negative impact on Africa’s initiative, resourcefulness and local industries.
- Now, is there any explanation for Africa’s continued overly reliance on mere meager Aid-money for infrastructure development, when it can mobilized larger fund locally in Africa?
- Will Africa’s infrastructure development and maintenance suffer if Aid-money dries up?
- In order to answer these questions, we would first ascertain the amount of money Africa requires for infrastructural development. 2009 World Bank’s report of study on Africa’s infrastructure funding conducted in 24 African countries estimates that:
2009 World Bank’s report of study on Africa’s infrastructure spending conducted in 24 African countries estimates that:

- **Infrastructure spending:**
  - $45 billion (current total annual infrastr. spending)

- **Should spend annually:**
  - $93 billion (right level of infrastr. spending) (15% GDP)
  - Half of $93 billion ca. $46 billion on power (7.5% GDP)
  - Comparable to China’s infrastructure investment over the last decade.

**Calculation I:**

\[
\text{US$ 47 billion (ca. 7.5 \% GDP)}
\]

(This is funding gap for power)
How to close funding gap of $47 billion (ca. 7.5 % GDP) needed annually for electricity infrastructure development:

The report shows

• $17 billion annual funding efficiency gap for all Infrastructure
  (= power $8.5 billion)

Calculation I:
$93 billion (15% of GDP) (right level)
-$45 billion (current level power)

$ 47 billion (power) (ca. 7.5 % GDP)
(This is funding gap I)

Calculation II:

$ 47 billion (funding gap power)
-$8.5 billion (efficiency savings)

$ 39.5 billion (rest funding gap power II).

✓
Closing the efficiency gap
(How to avoid waste due to inefficiency)

The UN recommends:
– improving management of utilities,
– ensuring adequate maintenance,
– promoting regional integration,
– recovering costs while recasting subsidies to enable broader access,
– and improving allocation and spending of public resources,

DESERTEC-Africa believes:
➤ Most of UN recommendations are best implement by the private sector
➤ Electricity market based on legislated policy framework would usher in private-sector-lead electricity infrastructure development in Africa with improved efficiency, as a result, has just a single recommendation / requirement for countries wishing to be part our electricity project
➤ put in place policy framework with focus on renewable energy
➤ However, the study also found that even if major efficiencies are gained, there is still a funding gap of ca. $39 billion every year much of it for power and water infrastructure in fragile states.
Closing the rest funding gap of ca. $39 billion needed annually for electricity infrastructure development: the *rest funding gap*

- could be closed using both budgetary, financial and other instruments as follows:
  - **a) Budget instrument:** - **adjustments to public budget** to allocate more fund, as percentage of GDP, to electricity infrastructure development.
  - **b) Financial instrument: Local capital markets:** The example of the telecommunication and Banking sector’s success in raising capital from ordinary citizen on the capital market is proof there is money from ordinary citizens to tap into in Africa for the funding of infrastructure development funding.
  - **c) The Private sector:** Desertec-Africa prefers private-sector based approach to electricity infrastructure development and we believe if policy framework is in place, they (private investors) will come. However, since “private investor” is not always “private investor”, we have refrained from using the expression “private investor”, instead have consistently used “private project
Private-sector-driven Electrification of entire Africa

Law makers (Legislators)

Government appointed officials

Market participants


SELLERS
- Project developers
- Equipment suppliers
- Financiers
- CSP, Wind, Geothermal, Ocean current, Biogas

BUYERS
- Independent Power Holding Company (PHC)
- Local PHC
- Homes, Hotel, Bank
- The Public
- Companies / Organizations
- Market instrument = share
- Budget instrument = % GDP made available as GRANTS; LOANS; TAX EXEMPTIONS

PRIVATE SECTOR CLEAN ELECTRICITY INFRASTRUCTURE PROJECT

Utility Scale

Rural Electrification

How energy is made available to consumers

Energy Efficiency

Funding (allocation of % GDP)

African RE market is huge

Workforce Training/Job creation

POLICY FRAMEWORK WITH FOCUS ON RENEWABLE-ENERGIES

LEGAL FRAMEWORK

LAWS ARE MADE BY PARLIAMENTS
1. Legislated Feed-in tariff
2. Long period power purchase guarantee for Renewable Energies only!
3. % GDP allocated to RE Infrastr. development
4. Scientific energy conversion chain should be employed
5. Gov. Rural electrif. projects to use panel that are made in Africa to ensure job creation.
6. Trained Workforce

REGULATORY FRAMEWORK

Regulatory / Licensing Authority (RA/LA)

RA/LA

RA/LA

RA/LA

Banks / Financial Institutions

Solarthermal panel for (hot water preparation/ Cooling), Greenbildung

Investment capital
Local sources first!

Turning huge market into huge Job opportunities for locals (policy driven)

CSP, Wind, Geothermal, Ocean current, Biogas

Off grid, micro grid
HVDC grid
Virtual grid

PV, Micro, Hydro-Power, biomass
Private-sector-driven Electrification of entire Africa


Law makers (Legislators)

Government appointed officials

PRIVATE SECTOR
CLEAN ELECTRICITY INFRASTRUCTURE PROJECT

UTILITY SCALE

RURAL ELECTRIFICATION

How energy is made available to consumers

Energy Efficiency

Funding (allocation of % GDP)

African RE market is huge

Workforce Training/ Job creation

POLICY FRAMEWORK WITH FOCUS ON RENEWABLE-ENERGIES

LEGAL FRAMEWORK

LAWS ARE MADE BY PARLIAMENTS

1. Legislated Feed-in tariff
2. Long period power purchase guarantee for Renewable Energies only!
3. % GDP allocated to RE Infrastr. development
4. Scientific energy conversion chain should be employed
5. Gov. Rural electrif. projects to use panel that are made in Africa to ensure job creation.
6. Trained Workforce

REGULATORY FRAMEWORK

Sellers

SELLERS
• Project developers
• Equipment suppliers
• Financiers

RA/LA

PV, Micro, Hydro-Power, biomass

• Off grid, micro grid
• HVDC grid
• Virtual grid

RA/LA

Solarthermal panel for (hot water preparation/ Cooling), Greenbildung

RA/LA

Investment capital
Local & foreign

RA/LA

Turning huge market into huge Job opportunities for locals (policy driven)

Who can be trained?

BUYERS

BUYERS
• The Public
• Companies / Organizations

• W. Africa RE-Communities
• Households

• National Power Holding Company (PHC)
• Local PHC
• Homes, Hotels, Bank

• share
• Budget instrument = % GDP made available AS GRANTS; LOANS; TAX EXEMPTIONS

Market participants
Private-sector-driven Electrification of entire Africa

Policy Framework with Focus on Renewable-Energies

Legal Framework

Laws are Made by Parliaments
1. Legislated Feed-in Tariff
2. Long period power purchase guarantee for Renewable Energies only!
3. % GDP allocated to RE Infrastr. development
4. Scientific energy conversion chain should be employed
5. Gov. Rural electrif. projects to use panel that are made in Africa to ensure job creation.
6. Trained Workforce

Regulatory Framework

RA/LA

Banks / Financial Institutions

Turning huge market into huge job opportunities for locals (policy driven)

Law makers (Legislators) Government appointed officials

Market participants


Sellers

- Project developers
- Equipment suppliers
- Financiers

- CSP, Wind, Geothermal, Ocean current, Biogas

- PV, Micro, Hydro-Power, biomass

- Off grid, micro grid
- HVDCgrid
- Virtual grid

- Solarthermal panel for (hot water preparation/ Cooling), Greenbildung

Buyers

- Independent Power Holding Company (PHC)
- Local PHC

- Homes, Hotel, Bank
- The Public
- Companies / Organizations

- Market instrument = share
- Budget instrument = % GDP made available as GRANTS; LOANS; TAX EXEMPTIONS

Utility Scale

Rural Electrification

How energy is made available to consumers

Energy Efficiency

Funding (allocation of % GDP)

African RE market is huge

Workforce Training/ Job creation
Bold Plan for Electrification of entire Africa unveiled

Sketch of possible infrastructure for a sustainable supply of power throughout Africa and export to Europe via High-Voltage Direct Current (HVDC).

Requirement for countries that wish to be part of this bold initiative:
Policy Framework must be in place!
For details Contact: www.DESERTEC-Africa.org
DESERTEC-Africa Industrial Network

DESERTEC-Africa Industrial Network (DAIN)

Public Initiative

Academic Initiative

Political Initiative

Green Building / Green Architecture Initiative
Conclusion:

Tackling the challenge of insufficient or lack of RE-policy framework

- African countries must demonstrate seriousness to improve their electricity infrastructure by putting comprehensive RE-policy framework in place.
- Establish electricity-infrastructure-market (*initial political support*) based on this policy-framework,
- and may have to make the first purchase (initial financial support in form of setting aside the right percentage of their GDP for electricity infrastructure development, made available to private project developers in the form
  - long-term power purchasing guarantees for Renewable energies (not for fossil energy).
  - Electricity tariff, effective feed-in tariffs, investment tax credit, production tax credits (and if need be equity ownership by public organizations, Desertec-Africa do not encourage this though), instead of direct government involvement in project contract awards and execution). These financial instruments from government would encourage sellers such as private project executioners and equipment suppliers (private sector) to see the market as well established and participate in it.
Conclusion:
Tackling the challenge of insufficient or lack of RE-policy framework

- As soon as policy framework is in place government should restrict itself to licensing and regulation.
- A policy insufficient, obsolete or even works against RE development:
  - When the role of government is expanded to include award of contract for power projects
  - When power purchase guarantee is extended to power generated from fossil fuel.
  - When there is fossil fuel subsidy, when electricity subsidy is not a support scheme for RE development (rural electrification, levelized price, user tariff versus feed tariff).

Thank you
DESERTEC-Africa’s Time Plan for Electrification of entire Africa

Unveiling Operation Electrify Africa To Save The Climate

2020: Africa exports clean energy to Europe
> Good for Africa, Good for Europe


Operation Electrify Africa ! Phase (2):
Electricity Export to Europe

HVDC

2010-2015:
Feed-in tariff-stimulated, private sector-driven electrification (Africa produces enough electricity to process its minerals locally)
> Job creation in Africa, Good for Africa,
> less emigration to Europe, good for Europe
> Good reason for Europe to invest in Africa’s electrification instead of spend on walls to keep away immigration from Africa.

Independent Power Producers & National Electricity Bourse

Operation Electrify Africa ! Phase (1a): Policy framework

HVDC

Electricity-Selling Rural Consumers (with real possibility to live off the grid)

Regulated electricity feed-in tariff $/kWh generated by renewables

Commercially sourced PV-Modules

2010-2015: Africa’s Rural electrification initiative (with IRET-Fund)
> Less trees are cut for desperately needed fire wood,
> job creation in Africa’s rural areas,
> less rural-urban migration,
> less emigration to Europe
> Good for Africa, good for Europe, good for climate

Rural electrification (Sanitation option)
(Rural Consumers receive 150 - 200 KW PV-panel)

Rural electrification (Basic option)
(Rural Consumers receive 50 - 70 KW PV-panel)

PV-Panel trade-by-barter (households get PV-panel against either tree planting or adoption of modern sanitary systems)

IRET - Trust-Fund for PV-Panel Production in Africa & Renewable Energy Workforce Training

Requirement for countries wishing to be part of this bold initiative: Policy Framework must be in place by 2010. For details Contact: www.Desertec-Africa.org