Power to Africa

installing instant operational power plants to serve/boost its emerging economies made possible by a PPP model
Power Generation Solutions
For
Africa's Emerging Economies

Instant / Permanent / Renewable
The IDB is owned by 56 nations worldwide and serves them.

IDB managed financed nation electricity generation models.

Based on Islamic (equity instead of debt) financial principles.
The 56 nations the IDB serves

Afghanistan  
Albania  
Algeria  
Azerbaijan  
Bahrain  
Bangladesh  
Benin  
Brunei  
Burkina Faso  
Cameroon  
Chad  
Comoros  
Cote d'Ivoire  
Djibouti  
Egypt  
Gabon  
Gambia  
Guinea  
Guinea Bissau  
Indonesia  
Iran  
Iraq  
Jordan  
Kazakhstan  
Kuwait  
Kyrgyz  
Lebanon  
Libya  
Malaysia  
Maldives  
Mali  
Mauritania  
Morocco  
Mozambique  
Niger  
Nigeria  
Oman  
Pakistan  
Palestine  
Qatar  
Saudi Arabia  
Senegal  
Sierra Leone  
Somalia  
Sudan  
Suriname  
Syria  
Tajikistan  
Togo  
Tunisia  
Turkey  
Turkmenistan  
Uganda  
United Arab Emirates  
Uzbekistan  
Yemen
Africa

• Area: 30,221,532 km² (20% of global land mass)

• Countries: 54 (and 2 disputed)

• Population: 1.1 billion (15% of global population)

• GDP: $5 trillion (5% of global GDP, 33% of global average, but catching up quickly)

• Economic Growth: average 5% (but some nations even grow 20% annual)

• Power Generation: 0.6 TWh (3% of global power generation for 15% of global population)

• Power Consumption per capita: 600 kWh (20% of global average of 3000 kWh)
Power demand

• One diagram tells it all: Africa has 1.1 billion people (2 times that of Europe) currently at 10% of Europe’s power supply level (which is a good average prosperity level). So Africa will need roughly in the future: 2 times 10 = 20 times the current supply. Or looking at national level: the national electricity demand growth rate equals the national GDP growth rate.
Instant Solutions Needed

• All energy generating policy documents are interesting and nice, but a more less theoretic more ‘hands on’ approach is needed.
• Many cities/regions just have a power generation deficit while having infrastructure and billing already running.
• Delivering these cities/regions instant power generation plants will be equal with delivering them an economic progress boost.
• Those instant power plants should operate in full synchronization with the existing power grid to deliver a stable/clean power environment on the power grid.
So a choice for a ‘hands on’ strategy

• The approach should be very much ‘hands on’. We like green energy, but we like economic progress (that will deliver green energy demand) more.

• Therefore: we like solar PV, we like seawater based desert farming based food and biofuels production, we like geothermal energy (we’re even quite a big global opinion leader regarding the global roll-out of those three renewable energy sources), but we are above anything pragmatic.

• But: nations/regions/cities needs power here and now, not sometime in the future, here and now. Delivered in models everybody understands in one second and not in new models that needs years just ‘to sink in’ peoples perceptions.
So the 3 phases model

• Our approach delivers both pragmatic solutions, as well energy security (plant output security, fuel diversification, fuel efficiency) strategies:

• Our first step is installing enough instant central and decentral operational power plant capacity. It solves the power deficit of cities/regions instantly, delivering them overnight better economic growth perspectives. Available in any capacity build out of modules, so no fuel will be spend on unnecessary power generation as demand varies. Plug and play. Those instant power plants operate in full synchronization with the existing power grid to deliver a stable/clean power environment on the power grid. They could be combined with using the other wise wasted heat by warmth pump technology to cool vegetables export warehouses till 1 degree Celsius. Fuel efficiency: 40% (straight) to 50% (with warmth pump technology).

• Our second step is realizing higher fuel efficiency power permanent central power generating facilities. Klimstra Consultancy will make the overall national power generation plan. Hares Engineering will design the technology. Designed around maximal fuel efficiency, fuel availability, fuel flexibility, actual demand data and growing demand forecasts. Focused on national available fuels and where possible also on natural gas (as global reserves of that are huge and new discoveries are done each year and as natural gas burns very clean relatively to other fuels). With also maximal use of generated heat too (not only the high potential range of it, but also the low potential range of it). Fuel efficiency: 50 to 60%. For better energy efficiencies implementation of Phase 3 (inflow of renewables) is needed.

• Our third step will be realizing a massive inflow of decentral renewables: domestic power generation for houses/offices based on PV (we don’t believe that much in wind energy: not economic yet). For the North African region we will promoting seawater based desert farming for food and fuel production. Fuel efficiency: far above 100% (as renewables produce fuel less). PV (solar) is the most attractive renewable option: earn back time of maximal 4 years (inclusive capital costs), delivering after that one or two decades fuel free energy and the decentral generation characteristic of it delivers less need for upgrading power infra lines.
So the PPP model

• We do only PPP (public private partnership) projects. These can be done fast and good.
• The government has a 50% share in the PPP. The other 50% is being used to realize the finance without debt.
• This market involvement makes financing very easy, yet the government still holds a 50% controlling position.
• The PPP model makes extending national power generation capacity (and by that economic progress) as simple as signing a simple one page straightforward contract with no small print in it.
• We take it instantly from there. Sign, plug, play is the model we think/know that’s needed.
Making it just a choice

• Getting it equals just a governmental signature (national or municipal) under a basic contract (one page with no small print on the backside).

• This one page contract erects an entity where the government has a 50% share in the operation and delivers a) a production location, b) a power demand guarantee, a fuel supply guarantee, d) an operation insurance guarantee.

• We take it from their (while the government still controls it by its 50% share) and start with organizing the finance to deliver the instant needed power generation capacity.
Supporting governments in realizing power generation capacity

• From out the PPP we organize the finance to deliver nations the needed power generation capacity (in three phases: instant, permanent and renewable).

• If wanted/needed we can also take care of bilateral agreements based hydrocarbon fuel supply security contacts/contracts for a nation too (as power generation security is needed to boost economic growth).
Organizing the finance basket

- We make an equity dominated finance basket based on Islamic ethics.
- Islamic asset-based financing is a debt free mechanism in which the investors form a partnership with the owner of the project, generating income from the asset revenues.
- We always aim to make also bilateral barter deals a part of the equity basket.
- We always aim to make also BCS (bilateral currency swaps) a part of the finance basket.
Organizing funding by banks

• The development banks of the world take the issue of delivering electricity generation capacity to Africa very seriously. They all will get on board in this model.

• The global commercial banks could play a role too. But we don’t want to have funds of them not in the debt model, but in the equity model.

• The regional commercial banks could play a role too. But we don’t want to have funds of them not in the debt model, but in the equity model.

• The national commercial banks could play a role too. But we don’t want to have funds of them not in the debt model, but in the equity model.
Organizing funding by SWFs

• SWFs (Sovereign Wealth Funds) should leave the global casino of Wallstreet, US Treasuries and the dollar.

• SWFs of the hydrocarbon rich nations should invest in their domestic economy and bilateral in the economy of their customer nations.

• Less risks, more return and bilateral agreements that ensures long term mutual appreciated hydrocarbon contracts.
Organize funding by pension funds

• PFs (pension funds) should leave the global casino of Wallstreet, US Treasuries and the dollar.
• PFs should invest in their domestic economy and bilateral in the economy of their customer/supplier nations.
• Less risks, more return and bilateral agreements that ensures long term mutual economic progress.
Organize BCS driven funding

• If the central bank of a nation is willing to do currency swaps with other nations:
• We can provide/facilitate those between the central banks.
• BCS makes financing of not only power plants, but a lot more other investments very easy too.
Organize Productive QE driven funding

- Productive QE (QE structured to the productive sectors) is quiet different than Financial QE (QE for the financial sectors).
- Productive QE is non-toxic. It don’t subsidize banks, governments, businesses, nor households. It delivers less imports and more exports.
- Productive QE is purely investment focused and delivers both more monetary as economic health/strength.
- Productive QE can be used for energy investments too. But the types of energy investments are structured.
- Productive QE can be done in combination with EBS (Energy Backed Securities) so that any commercial bank can do these type of finance.
- The EQE/EBS model has also an debt free Islamic version. The EQE/EBS model is perfect for rolling-out massive decentral renewable energy generation.
- We can support/facilitate the national central bank by the roll-out of any Productive QE model. EQE (Energy), TQE (Trade: export/import), etc.
Organize barter funding

- If the government of a nation is willing to do barter deals with other nations:
- We can provide/facilitate those between nations.
- Barter makes financing of not only power plants, but a lot more other investments very easy too.
Phase 1: instant power plants

• Designed out of standard 40’ sea container sizes modules. The modules can be sea shipped by any commercial container ship.
• The modules can be unloaded by any container crane in every seaport. The modules can be transported to final location by any container truck.
• Those instant power plants operate in full synchronization with the existing power grid to deliver a stable/clean power environment on the power grid.
Phase 2: permanent capacity

• The Phase 1 instant temperately power plants deliver instant economic development and therefore they should be realized.
• But more energy efficient permanent solutions should be realized. Permanent solutions make higher fuel efficiency possible. So their CAPEX is higher (not necessary, it’s more an issue of volume design), but their OPEX is significant lower. The fuel efficiency of permanent solutions relative to instant solutions is 125% to 150% higher, making the fuel costs 20% till 35% lower.
• For the permanent capacity we prefer natural gas (by pipe line connection, as part of a transport corridor of pipes, power, rail, road or as imported LNG by ship and than pipeline). This as natural gas is a) abundant available in the world (enough for centuries to come: huge easy to explore reserves all around the world) and b) is the cleanest of all the hydrocarbons (so doesn’t pollute the environment around the plants).
• Permanent capacity often will be central hydrocarbon based, but they could also be realized decentral renewable based. Economics should decide this, not subjective historical perception ‘cart tracks’.
• Installing huge permanent central capacity also demands an capacity upgrade of the national HVAC grid. Another reason to favor decentral renewables over central hydrocarbons.
• In building Phase 2, we always eye also to Phase 3 too. As PV (solar) has a maximal earn back time of 4 years (inclusive installation and capital costs) and delivers after that one or two decades of fuel free / cost less / clean energy to boost a national economy.
Phase 3: renewable capacity

- PV now costs $360 KiloWattPeak capacity which delivers in Africa around 5 kWh a day for 365 days a year = 1800 kWh (fuel less: so only CAPEX costs, no OPEX costs).
- Over a 4 years period this will be 7200 kWh. Total costs of central hydrocarbon generation will be somewhere around $0.06. So the relative return is 7200 times $0.06 = $432 (so paying the $360 investment back inclusive generous capital costs).
- This calculation is even without national negative externalities of central power generation like grid power losses and more expensive capacity infrastructure.
- After those 4 years, the PV with produce for one or two decades free energy powering without fuel costs, nor urban air pollution Africa’s economic rise.
- It’s clear that the fuel-less PV model is the most attractive permanent power generation method. Our combined EQE/EBS model or just our standalone EBS model facilitates this decentral roll-out.
- We don’t believe that much in the current windpower technology. It’s just not economic. But new wind power technology could be. The nice thing of (only economic) wind energy models is that they produce at night when solar doesn’t.
- But in Holland they have developed a $5,000 very high tech wind mill of 80 cm diameter that generates an average of 19,000 kWh a year (19,000 times $0.06 = $1,140 per year lowest relative return). This would deliver a payback of investment and capital cost time of 5 years. But: wind mills have moving parts and moving parts wear out. So there will be some OPEX costs.
Instant plants: plug and play MW units

- As many units (of 1, 2, 5, 25 MW) can be lined up so meeting any demand is possible.
- Any multi unit based power plant delivers huge fuel efficiency/savings: As power demand varies during time of the day and day of the week and time of the year, only that much units will be operational to cover the demand.
- Any multi unit based power plant delivers a 100% uptime: As maintenance could be done in the time when that partial unit is off line: delivering power security to the city/region it serves.
- Later on capacity upgrades are as easy as ordering one or more MW units.
- Those instant power plants operate in full synchronization with the existing power grid to deliver a stable/clean power environment on the power grid.
Instant plants: fast installation time

• Local installation of the instant temperately power plant capacity is done in less than a week (if steady concrete beds are already available).
• The come with a full synchronization with the existing power grid unit to deliver a stable/clean power environment on the power grid.
• If concrete installations beds must be made etc, the local installation will be done in maximal a month.
• Building external shielding structures around the units will be done while the power plants is already in operation.
Instant plants: full knowledge transfer

• After the first month of operation a team of the manufacturers will hire and educate the local operation team.
• After the first quarter of operation a team of the manufacturers will support the local maintenance team.
Instant plants: internal fuel efficiency

- Fuel consumption of instant power plants with HFO engines is 200 kilogram per 1 mWh. The actual HFO price is somewhere around $ 300 till $ 400 per 1000 kilo, so $ 400 / 5 = $ 80 per mWh = $ 0.08 fuel cost per kWh (or by $ 300 per mt = 1000 kg that would be $ 0.06 per kWh).
- Fuel consumption of instant power plants with diesel engines is 213 kilogram per 1 mW/hour. Unfortunately the price of diesel is somewhere around 200% of that of HFO (delivering 200% higher fuel costs per kWh).
- By the concept of using multiple MW units as instant power plants, always only the needed capacity will be running (delivering huge fuel savings by avoiding power generation wasted surpluses).
Instant plants: external fuel efficiency

- If wanted a ‘heat pump’ technology can be added for cooling nearby cold storage food export warehouses: This would increase the vegetables/fish export revenues for a nation.
- If wanted excess power on the grid available can be used to cool not nearby but somewhere on the power grid located cold storage food export warehouses: This would increase the vegetables/fish export revenues for a nation.
- So both the heath surpluses during operation and the grid power surpluses at night can be used to cool nearby and far away export vegetable/meat/fish warehouses.
- This pushes energy efficiency even higher, while delivering nations a boost in exports by connecting to foreign markets. A boost in exports deliver nations both economic growth as monetary health.
Instant plants: fuel diversity

- The instant power plants that targets a low kWh price HFO (Heavy Fuel Oil).
- Diesel could also be used (but is unfortunately 200% in price of HFO).
- Natural gas is the cleanest option (natural gas could be supplied by pipe line, or imported as LNG delivered in LNG barges).
Instant plants: fuel storage/supply

• When the location of the power plant is near a river/channel/sea fuel barges are the perfect combination for both storage and supply: Empty fuel barges will be tugged to the fuel import ships/terminals and refilled.

• When the location the power plant is landlocked a serial fuel container system on wheels will be used. Making it possible to drive the empty containers to the fuel import terminals to refill them.

• When the location of the power plant is near an airport a redundant (geographical double lined) pipe can be installed to use the same fuel logistics as the airport.
Instant plants: grid connection

• The grid connection is one special module per power plant.
• Delivering full synchronization with the existing power grid to deliver a stable/clean power environment on the power grid.
• The grid module is redundant (always two available: so always one spare)
Importing electrons

- Importing electrons is also a quick fix.
- But it dangers a healthy FX balance.
- So it should be done only temperately.
- And it could be done in bilateral contracts.
- Than it is done FX balance neutral.
Exporting electrons

• In oil/gas areas with not yet available gas pipe line export infrastructure the power plants can be used to export electrons instead of molecules (as power export infra mostly is already available).

• This delivers more economic and monetary benefits of resources that otherwise would be flamed off.
Presidential invitations

• We are RWA (Ready, Willing and Able) to see any Head of State with a combined delegation.
• What we need to clarify the PPP potential for addressing the power generation issue is one day with 3 sessions of 1 hour.
• Invitations can be send to us by email with some date proposals mentioned.
• We invited everybody who likes Africa or their nation in Africa to connects us with their Heads of States.
• Solving power generation capacity issues is not the only huge economic development that could be done in the PPP model by us.
PPP potential for governments

- We do not only power generating PPPs. We developed a whole range of PPP models that governments could use to boost their economy significantly by the same easy to start model.
- power generation
- power infrastructure
- energy exploration/exploitation
- desert exploration/exploitation (sea water driven agriculture/aquaculture)
- fishing industry (ships, harbours, processing, storage, foreign demand)
- cold storage warehouses
- iron mills
- mineral exploration/exploitation
- fertilizer industry
- sea ports
- inland ports
- rail tracks
- roads
- trucks
- busses
- etc
- We know how to boost economies by PPP finance and realization. We understand that governments wants a 50% stake in these operations (as they are crucial sectors of their economy and they need revenues for delivering good governance).
Instant power generation plants
(build out multiple temperately 1 or 2 MW units)
Permanent power plants (high fuel efficient)
TYPICAL LAY-OUT SCHEME OF POWER-GENERATING UNIT

- Complex air intake equipment
- Gas turbine engine
- Gas volute
- Variable frequency drive of starting system
- Automatic control system
- Turbogenerator
- Turbogenerator lube oil unit
- Turbogenerator container
- Generator excitation control system
- Low-voltage distribution switchboard
- Engine lube oil unit
- Fire-fighting system
- GTE exhaust
- Gas turbine engine container
- Fuel equipment module
IDB: Islamic Development Bank (serving 56 nations worldwide)
Planck Foundation
(facilitating global sustainable prosperity)

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Hares Engineering
(engineering industrial plants worldwide)

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September 22, 2011

Executive Vice President and Representative Director
Kobe Steel, Ltd.
Klimstra Consulting
World Renown Independent Power Generation Consulting
(with an eye for maximizing renewable energy too)
The DesertCorp model
(seawater on deserts based) food/energy
Global solar PV roll-out  
governmental underwritten/driven

Government Underwritten/Driven  
Regional  
Massive Solar Energy Roll-Out Model

(which can be realized instantly for any Municipal/Province/State)
Geothermal roll-out (governmental underwritten/driver)

There is another possible multilateral approach to the Iceland economic issue. This 'third road' doesn't get the exposure it deserves.

Despite "No, there is no B plan," he said. "Something new has to come into the picture ... But this has to be very drastic and with an outlook for a solution." (http://www.reuters.com/article/idUSLDE50700I20100108), there's certainly a Plan B available.

Plan B just needs some exposure. But first the polarization must be down played. Both international, as domestic. Some common ground must be realized first. UK/NL/IS must realize that they're in this not very pleasant situation together. Iceland's total external debt is now above 900% of its GDP, half of that is short term, on top of that declines the economy in rapid speed, so the GDP/debt ratio only will increase more as nothing will be done.

I hope this information will get you interested in Plan B. Plan B is a 'third way' called 'Energy for Debt' and has upside for...
More information?

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