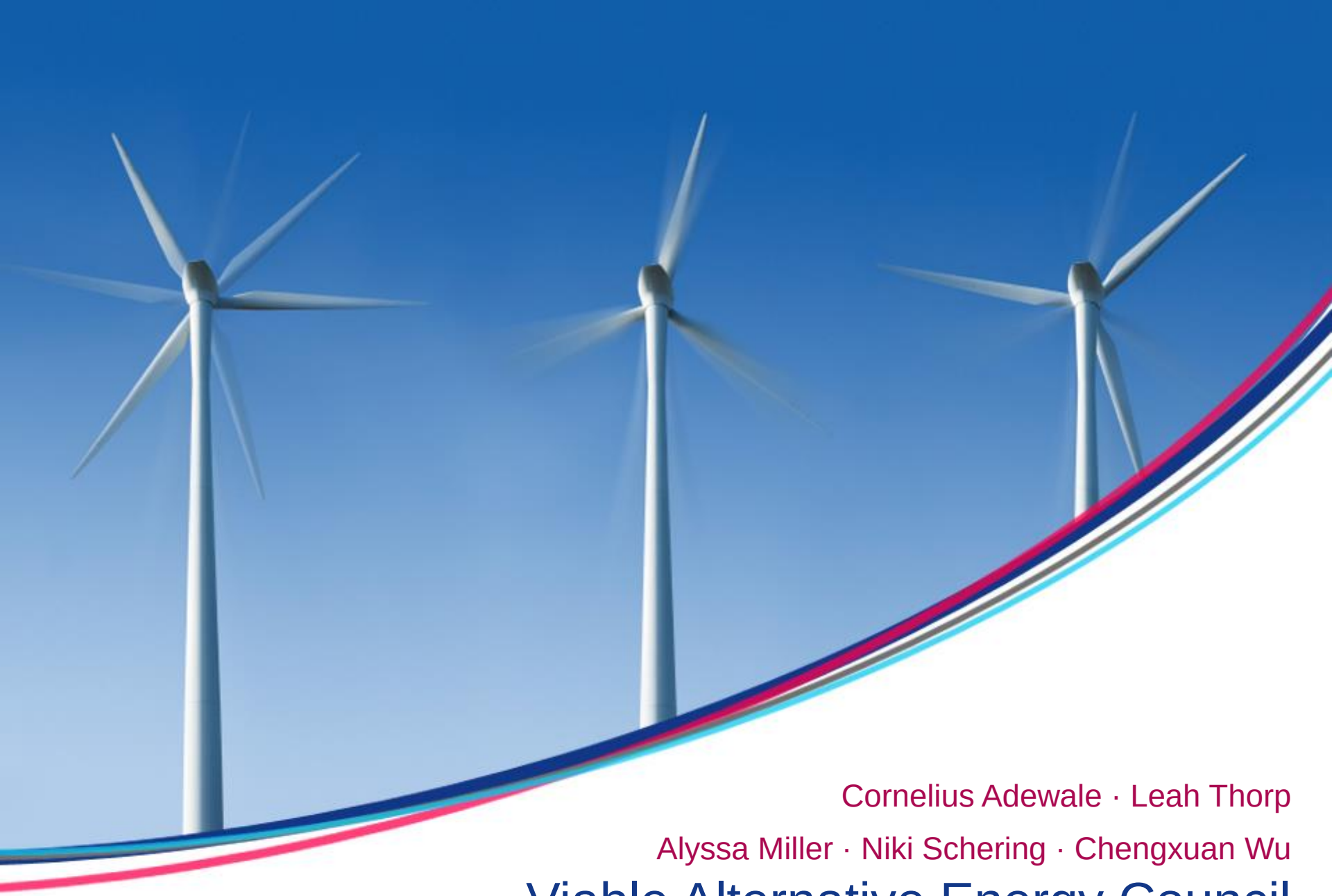

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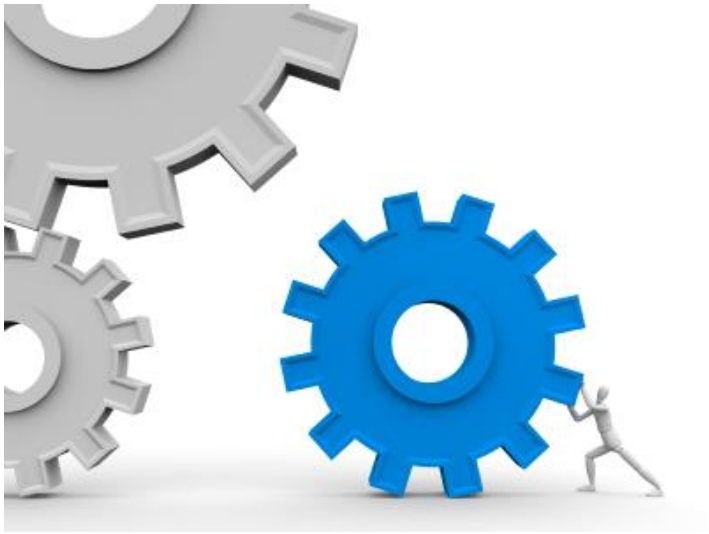
Viable Alternative Energy Council

Our Solution

Key factor:

- Privately driven Initiatives
- Involve the people
- 6 Geopolitical regions
- Decentralized, yet be efficient



Creation of an atmosphere in which each geopolitical zones of the country will be responsible for production, distribution and use of energy.

- Decentralization creates connection and responsibility for their energy
- Privately driven renewable energy grid.
- Individuals, companies, communities and organization can then go into the business of renewable energy and sell their surplus renewable energy to the grid

Needed Policies

A. **Production**: Ongoing support for renewable energy policy and regulation that encourages private investment.

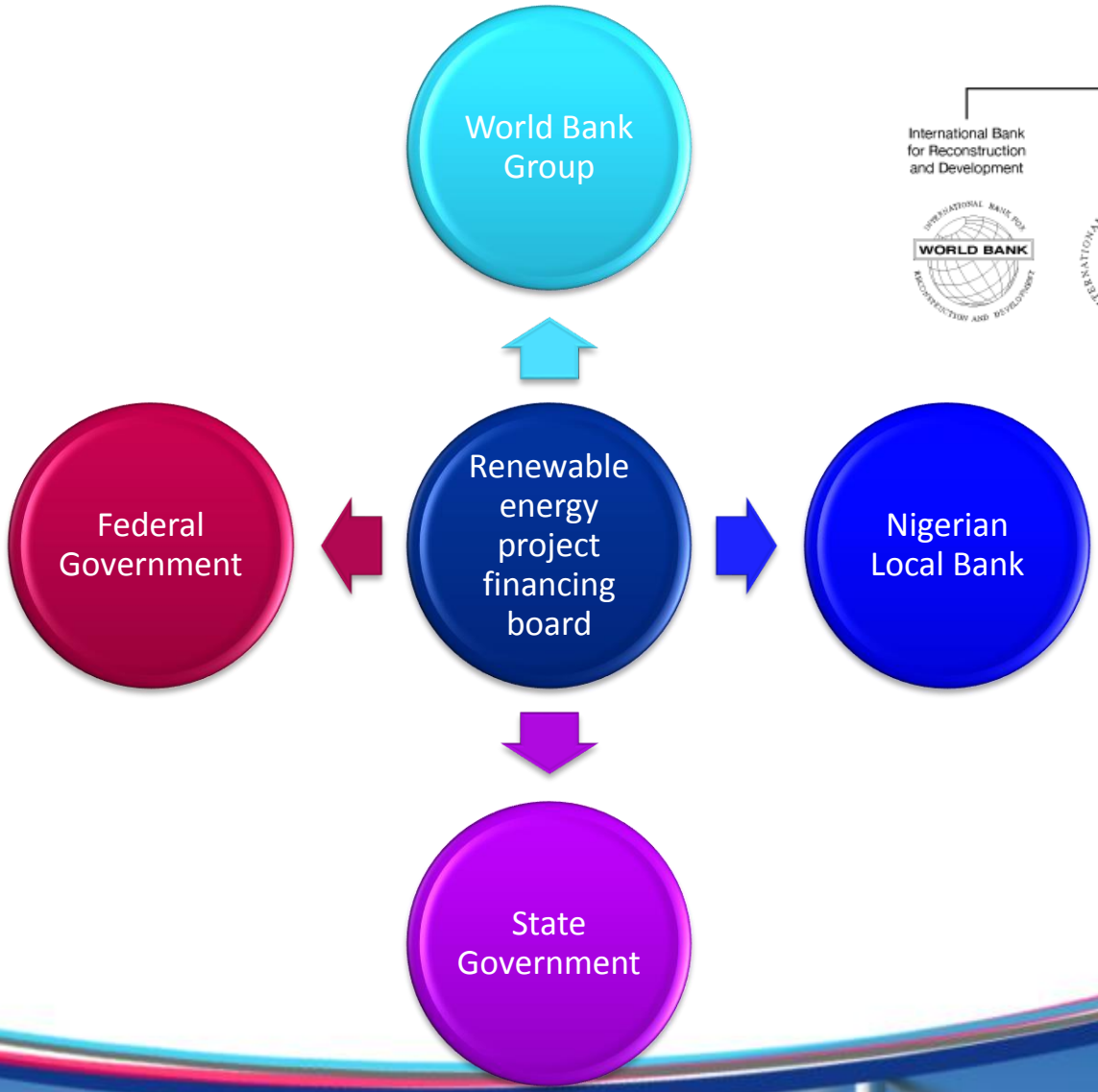
- Guaranteed energy pricing system for renewable energy
- 10yr Tax holiday for renewable energy company
- Interest free loan for renewable energy related projects
- Premium for renewable energy usage.

B. **Transmission**: Need for high level of efficiency

PPP(Public, Private Partnership) – Regional Renewable Energy grid.

C. **Distribution**: PPP - Renewable Energy Distribution Companies

Financial Board of independent renewable energy projects



Policy Implementation

Campaign for adoption and use of renewable energy

Renewable energy training centers

Emergency fund and State testing fund

Renewable energy project

What We See: Biomass

- 70% Nigerians work in agriculture
- Extensive vegetation in Nigeria makes biomass attractive source
- Waste management is a big menace

- **Sources**
  - Oil crops: Jatropha, Oil Palm
  - Wet biomass—Anaerobic digestion (ADP)
  - Dry solid biomass—Pyrolysis and waste management
  - Energy crops (Cassava, Corn, Soya)
- **Implementation**
  - Biomass is a renewable energy source that could easily implemented within short period of time
- Short term — 20 MW (ADPs)/Day
- Medium term — 75 MW (ADPs, Biofuel, Energy crops)
- Long term — 220 MW

What We See: Hydro and Solar Energy

- **Hydroelectric**
  - is currently 29% of Nigeria's electrical supply
  - 4,000MW utilized with 11,000MW potential
  - 3 out of 6 geopolitical regions already have hydropower
  - Small hydropower systems can be implemented throughout Nigeria

- **Solar-thermal and solar photovoltaic**
  - With 5% efficient solar technology covering 1% of Nigeria's surface, it would be equivalent to 4.66 million barrels of oil per day

- **Implementation**
  - Hydro-electric and solar radiation are energy sources that could be implemented within a short period of time but will be best implemented in a staggered fashion.

Short term — 5,500 MW/day
Medium term — 13,200 MW
Long term — 19,000 MW

What We See: Wind and Nuclear Energy

- **Wind**
  - Port Harcourt and Sokoto states have estimated potential of 4.51 and 21.97 watts per square meter of blade area
  - When wind speeds are greater than 3 m/s, energy per unit area is 168.63 and 1,556.35 kWh per square meter of blade area

- **Nuclear**
  - Long term solution—25 year plan
  - Minimum of six nuclear plants with one for each geopolitical zone

- **Implementation**:
  - Wind and nuclear power are longer term projects that have great potential

Short term — 35 MW/day
Medium term — 922 MW
Long term — 13,625 MW

Implementation Timeline

- **Short 1-5 Years**
  - Biomass—20 MW
  - Solar—950 MW
  - Hydro—5500 MW
  - Wind—35 MW

- **Medium 5-10 Years**
  - Biomass—75 MW
  - Solar—7500 MW
  - Hydro—13,200 MW
  - Wind—72 MW
  - Nuclear—850 MW

- **Long 10-25 years**
  - Biomass—220 MW
  - Solar—26,000 MW
  - Hydro—19,000 MW
  - Wind—125 MW
  - Nuclear—13,500 MW

Challenges to Renewable Energy

- Possible challenges from petroleum industry
- Coordinating the buying/selling of energy
- Working with a diverse population
- Instability of federal government
- Variations in renewable resource amounts
- Importation and technical compatibility of technology
- High start-up costs/Financial constraints
- Possible low level of public awareness of renewable energy
- Lack of national comprehensive energy policy

What Nigeria Gains

- Decentralization may help solve Nigeria's economic, social and environmental problems
- Sustainable, renewable energy production will stimulate economy
- Clean up the environment- air, land and water
- Work toward fixing waste management system problem
- Unification of country—citizens have sense of responsibility and community

Questions?

Citations upon request