The role of renewable energy to improve energy access in developing countries

Going beyond pre-conceived ideas

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SNV DRC

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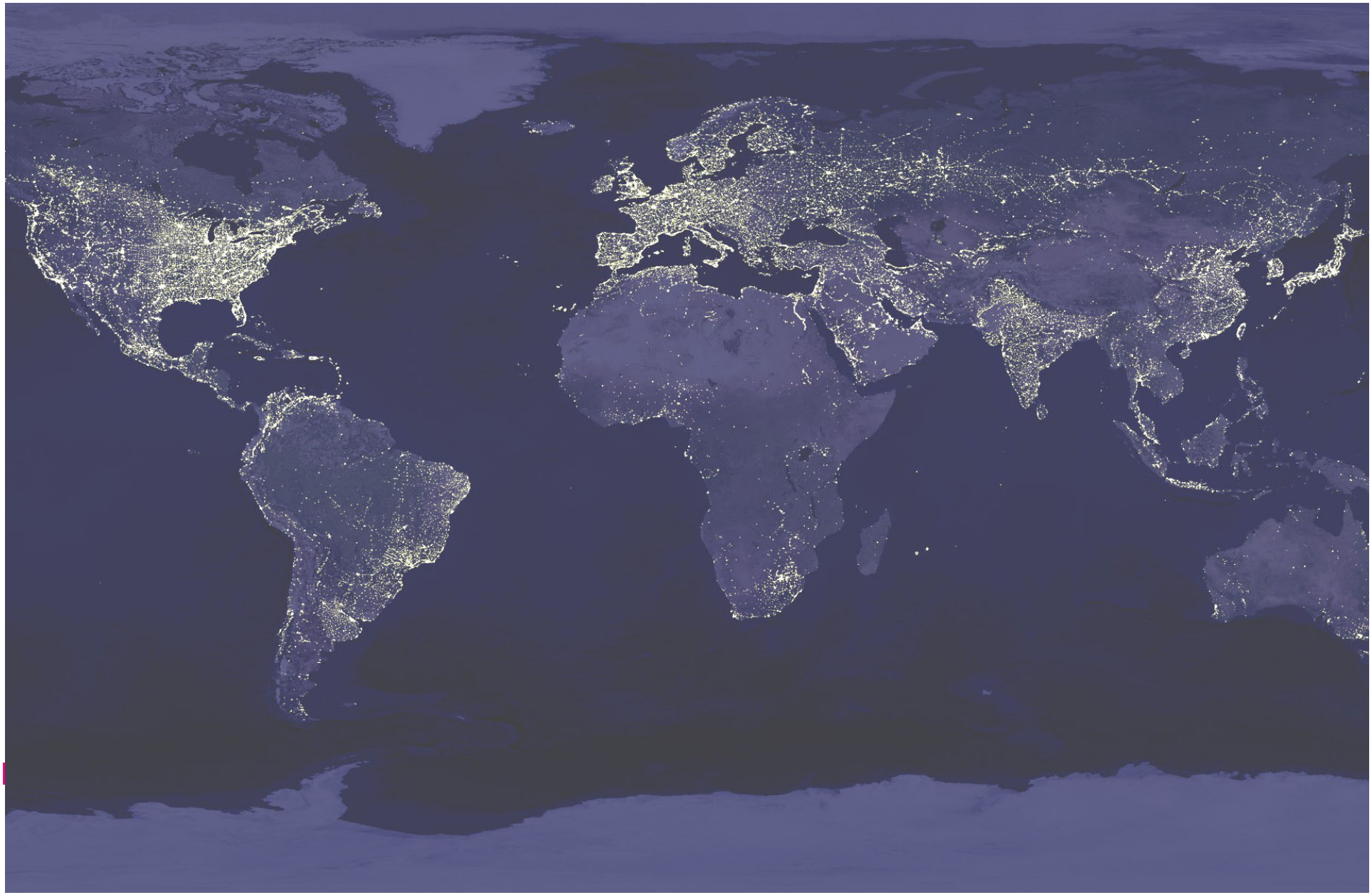
"Ending poverty and ensuring sustainability are the defining challenges of our time.

Energy is central to both."

World Bank President Jim Yong Kim, 2013

The earth at night…



In Numbers

- More than 1.3 billion people without access to electricity
- 2.7 billion people without clean cooking facilities
  - 95% in Sub-Saharan Africa or developing Asia
  - 84% in rural areas

WEO, 2011

How do we move forward? Pre-conceived ideas

- Centralized power sector development
  - Provides opportunities for development
  - Is cheap and reliable
- Decentralized/Off-grid options do not provide opportunities for income generating activities and are unreliable, expensive, season dependent, etc.
- Biomass is the fuel of the poor
  - Needs to be replaced by LPG or electricity
  - Fuelwood related policies are not necessary

As a result…

- Current investments for improved access to modern energy are mainly for on-grid electricity connections in urban areas (WEO, 2011)
- Only few countries with fuel wood policies

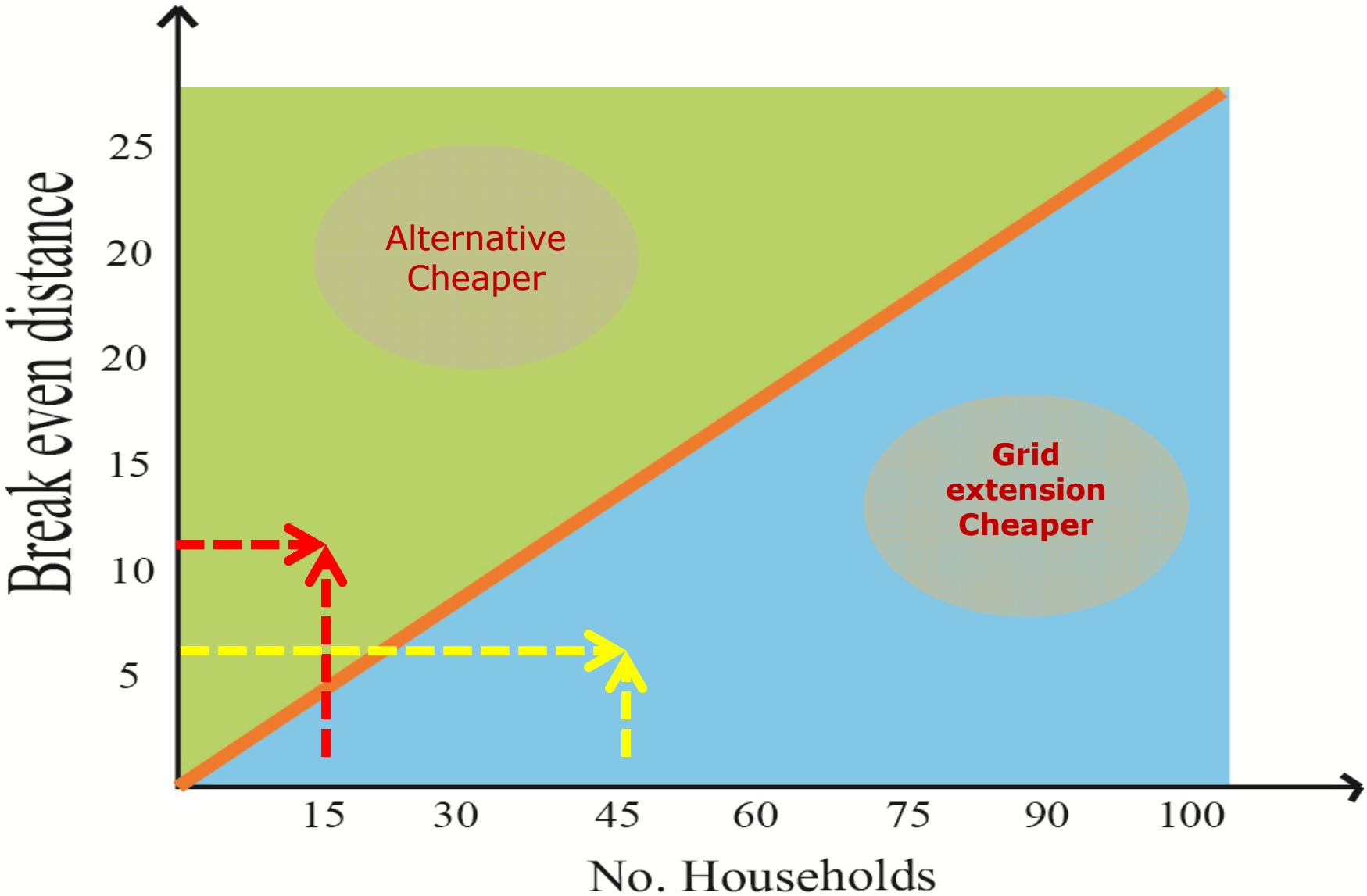
As a result…

Is the centralized model the cheapest?

- A financial model developed in Laos
  - How much does it cost to supply a certain demand to a given village (like for like comparison)?
  - Comparing grid vs. 4 DRE (solar, pico and micro-hydro)
  - Outputs: breakeven distance in terms of number of hhs or NPV of different options

Freely available online: www.rise-laos.org

For small villages and long distances, alternatives can be cheaper



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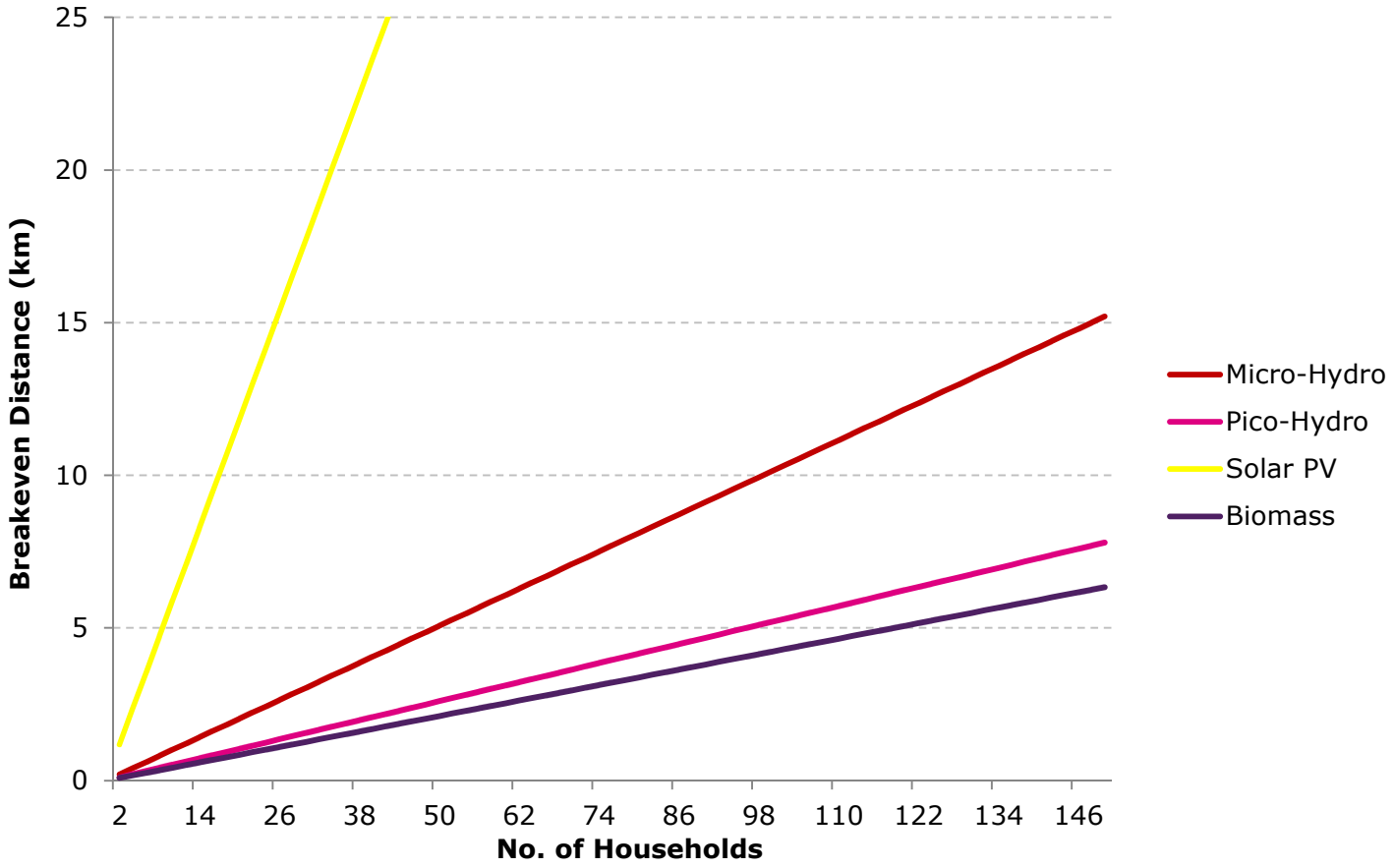

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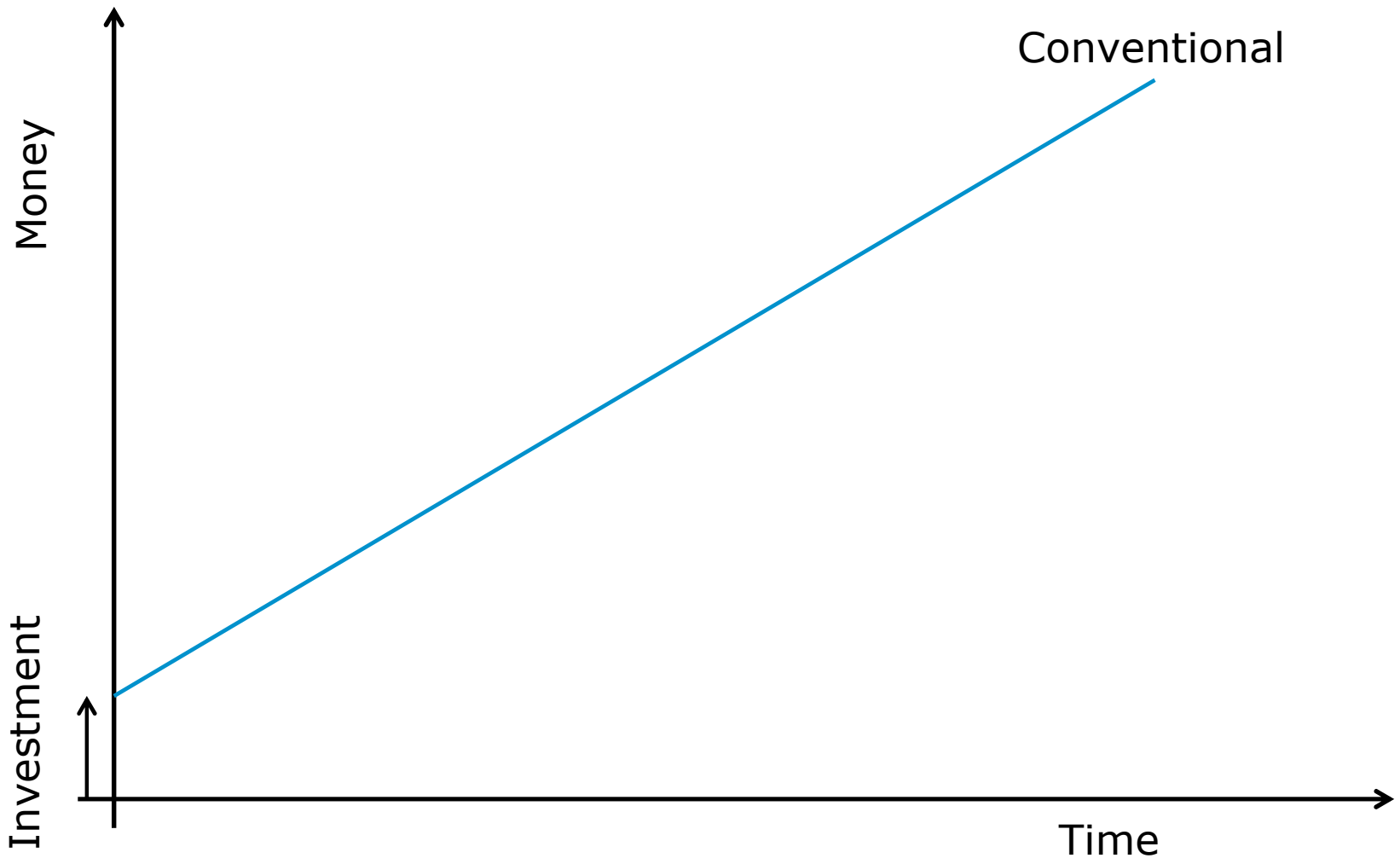
Are renewables always more expensive?

- Price structure very different
- Conventional:
  - Low investment, high O&M costs
- Renewables:
  - High investment, low O&M costs

Are renewables always more expensive?



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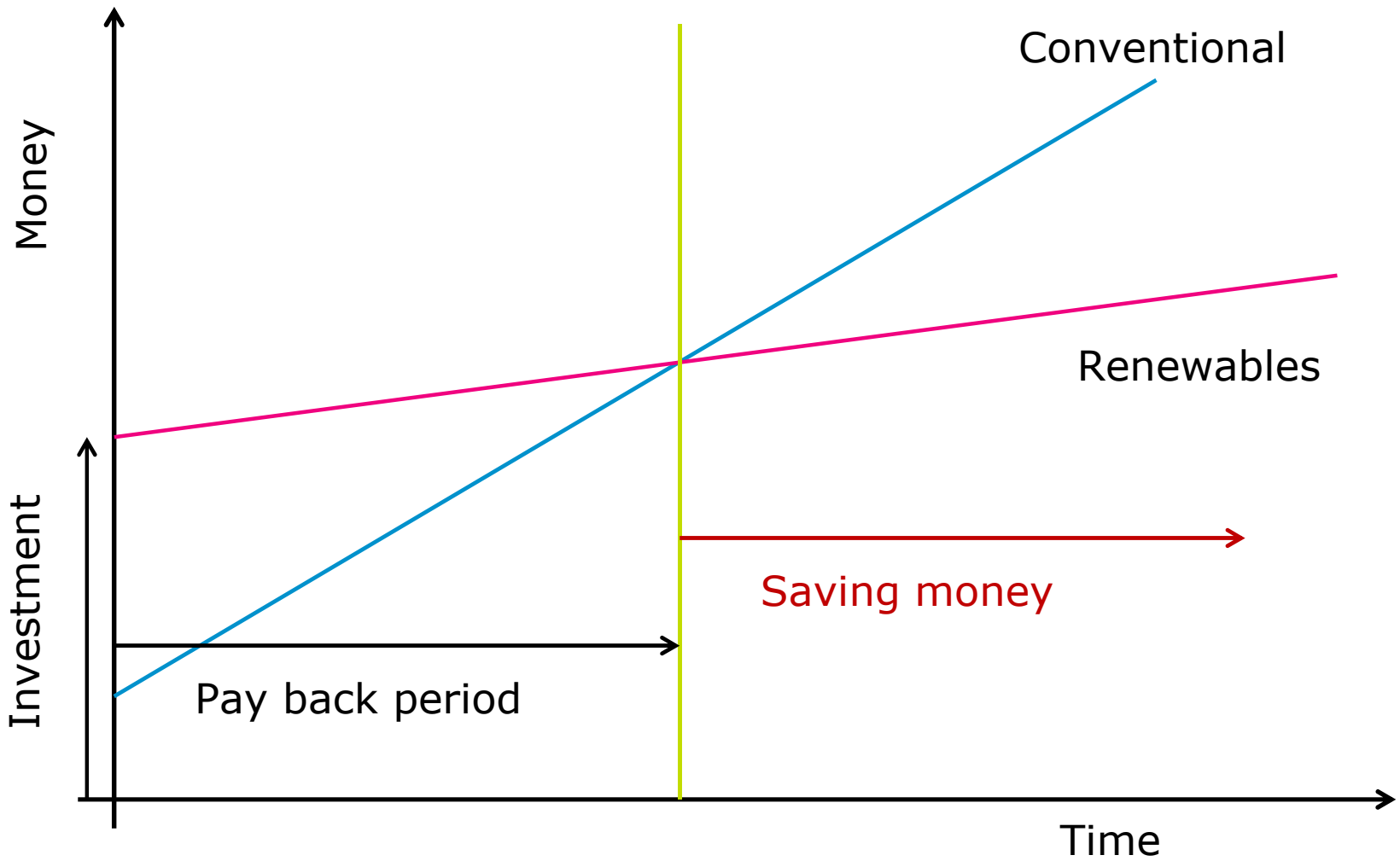

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Example of pay back periods:

- Good quality Improved cook stove in Kinshasa:
  - Investment 10 times higher than conventional cook stove
  - Payback period: 3 months

- Solar pumping system for bananas and oranges in Kasai (data WEaST Energy)
  - Investment 12 times higher than Diesel
  - 5.7 years

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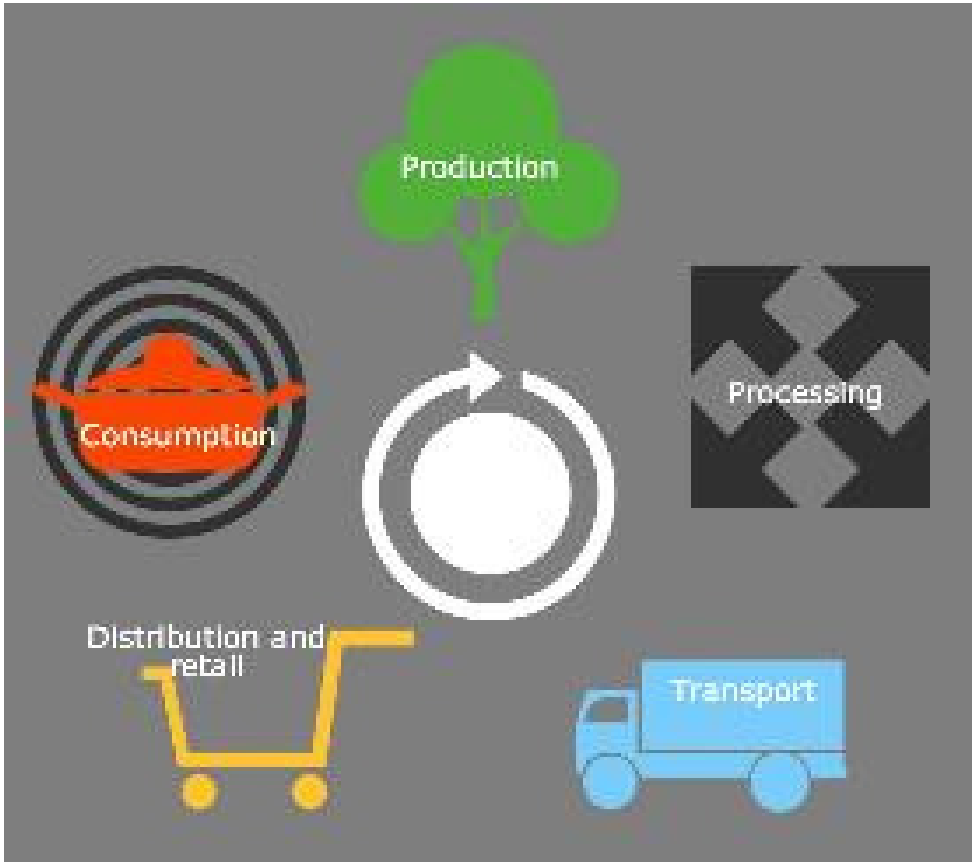
Non-financial benefits of renewables

- Environment
- Local job creation
  - Locally produced biofuel in Gemena supported by SNV
- Flexibility to address the most important needs
  - Participatory approach developed by SNV in Zimbabwe
- Empowerment

The need for innovative policies/planning tools to level the playing field

- Fuel wood assessment tool
- Integrated resource planning
- Feed in Tariffs
- Tax exemptions
- More examples to follow in the forthcoming Renewable Energy Atlas (UNDP/SNV)

Fuel wood value chain assessment by SNV



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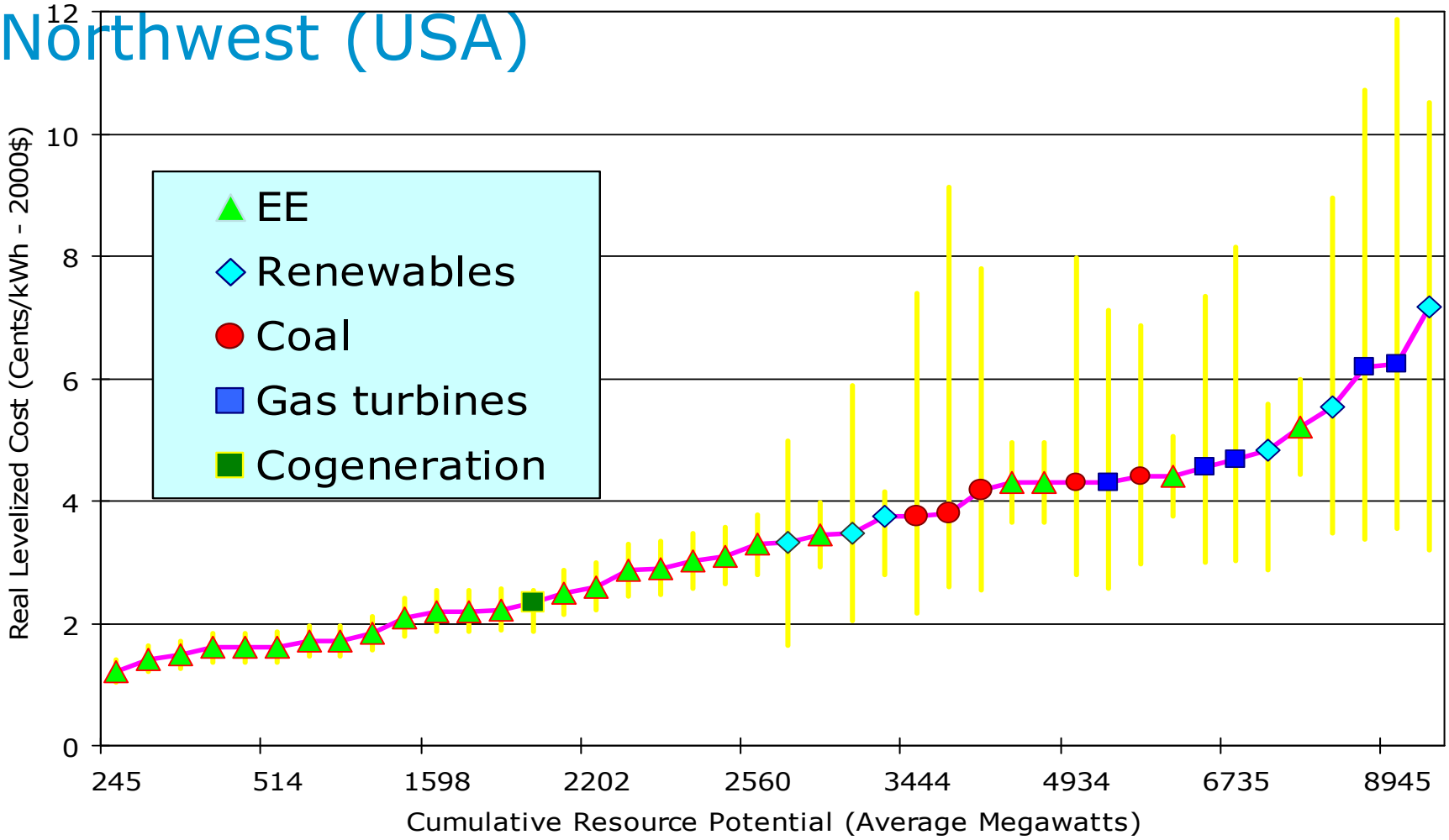
Fuel wood value chain assessment by SNV

- Analysis of main impacts at each step of the chain
  - Prioritisation
- Intervention to mitigate main impacts
  - Production: wood plantation
  - Transformation: improved kilns
  - Use: Improved cook stoves
  - …

Integrated Resource Planning (IRP)

- IRP: meeting power sector objectives at the lowest cost.
  - Consider a range of different options
  - Include all costs (generation, transmission, social & environmental costs)
  - Choose option the provides best benefit at lowest cost/risk profile

EE and RE as main options to satisfy the growing demand – example from the Pacific Northwest (USA)



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Concrete example for Kinshasa

- 700’000 households switching to CFL light bulbs (3 bulbs/household)
  - 70MW saved
  - Cost: 21mio$ (worst case)
- Cost of 70MW power plant + transmission + distribution?

Feed in tariffs

- A set of rules regulating what happens when a renewable energy technology is connected to a grid (big or small)
  - Financial
  - Technical
  - Administrative

How feed in tariffs boost investments in renewable energy

- In Thailand
  - RE installed capacity AAGR: 21% (06-12)
  - About 1.6 GW installed
- In Tanzania
  - 11 renewable energy small independent power producers projects under construction
    - About 33 MW (hydro, biomass, solar)

Tax exemption for renewables

- Reduced Government earnings from reduced tax can be balanced by financial benefit of renewables

Tax exemption for renewables – Example from SNV Niger

- Market study
  - High interest for solar lights
  - Price main barrier for adoption
- Import tax (52%)
- Ministry of Finance import exemption for 1,240,000 solar lights certified "Lighting Africa"
- 1,000 lights sold in 1 month
- Reduced kerosene import, risks of fire, indoor air pollution

Conclusion

- Small scale decentralized renewable energy, *besides being cleaner*, can
  - Be cheaper than centralized conventional sources
  - Provide opportunities for local job creation
  - Be adapted to changing needs
- Need innovative policies to boost their widespread use:
  - Energy sector planning based on real least cost options
  - Financial mechanisms to "spread" high initial investments over some time
  - Fiscal measures which provide more benefits than costs
  - Focus on the most used energy sources
    - E.g. biomass

Thank you for your attention

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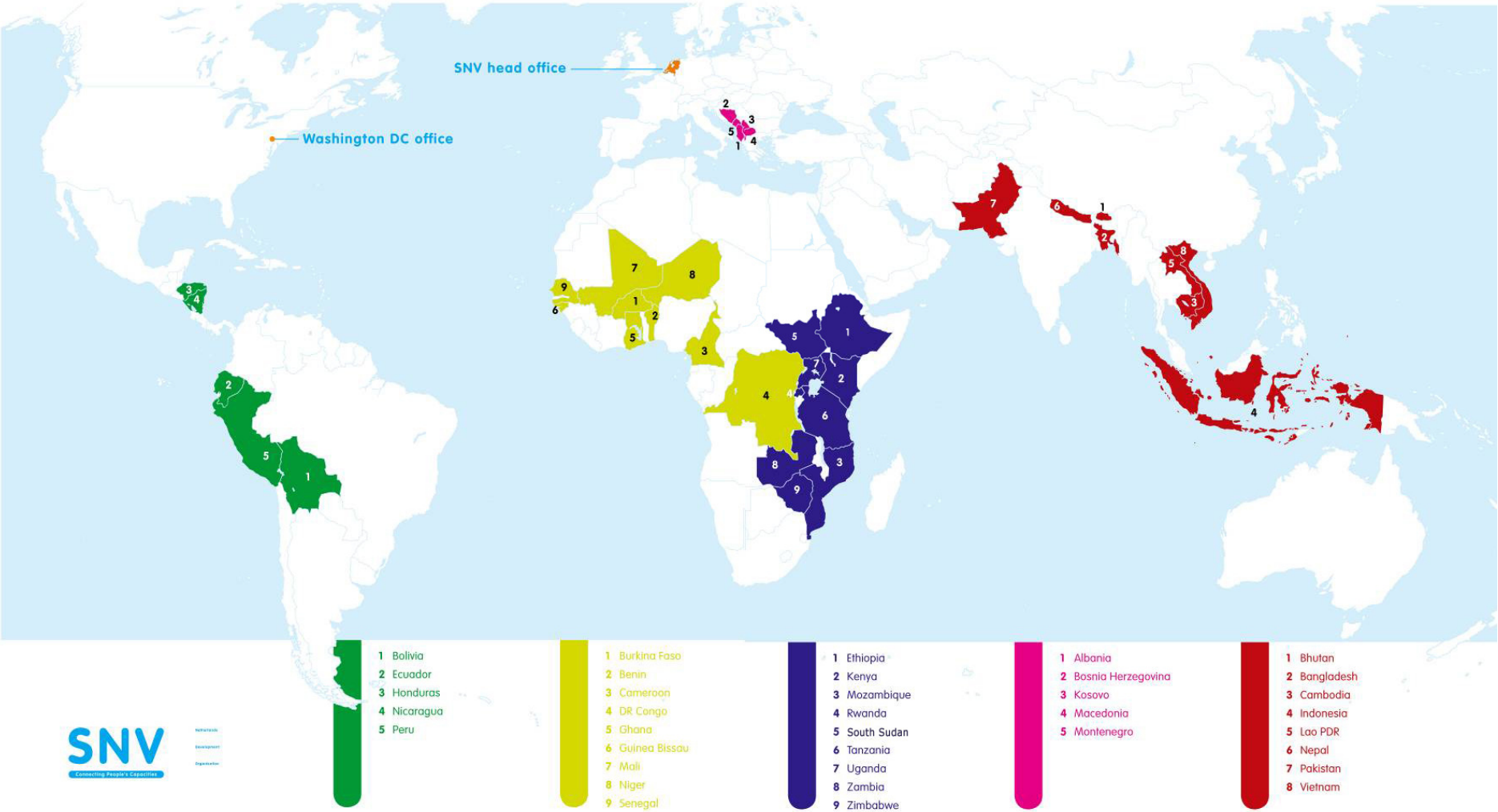
SNV – Netherland Development Organisation

SNV is dedicated to a society in which all people, irrespective of race, class or gender, enjoy the freedom to pursue their own sustainable development.

We believe that no one should have to live in poverty and that all people should have the opportunity to make their own choices about their future and that of their communities.

Our presence

- SNV works in 36 countries worldwide, with over 100 local offices.
- Head office is in The Hague and we have a representative office in Washington DC.



Global presence, local impact

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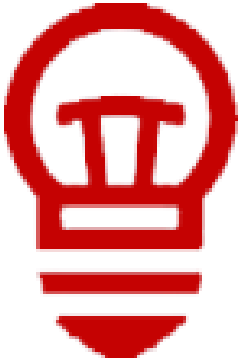
Our focus

Increasing **income**, **production** and **employment opportunities**

Improving **access** to, **coverage** and **quality** of **basic services**

Food

Water



Energy

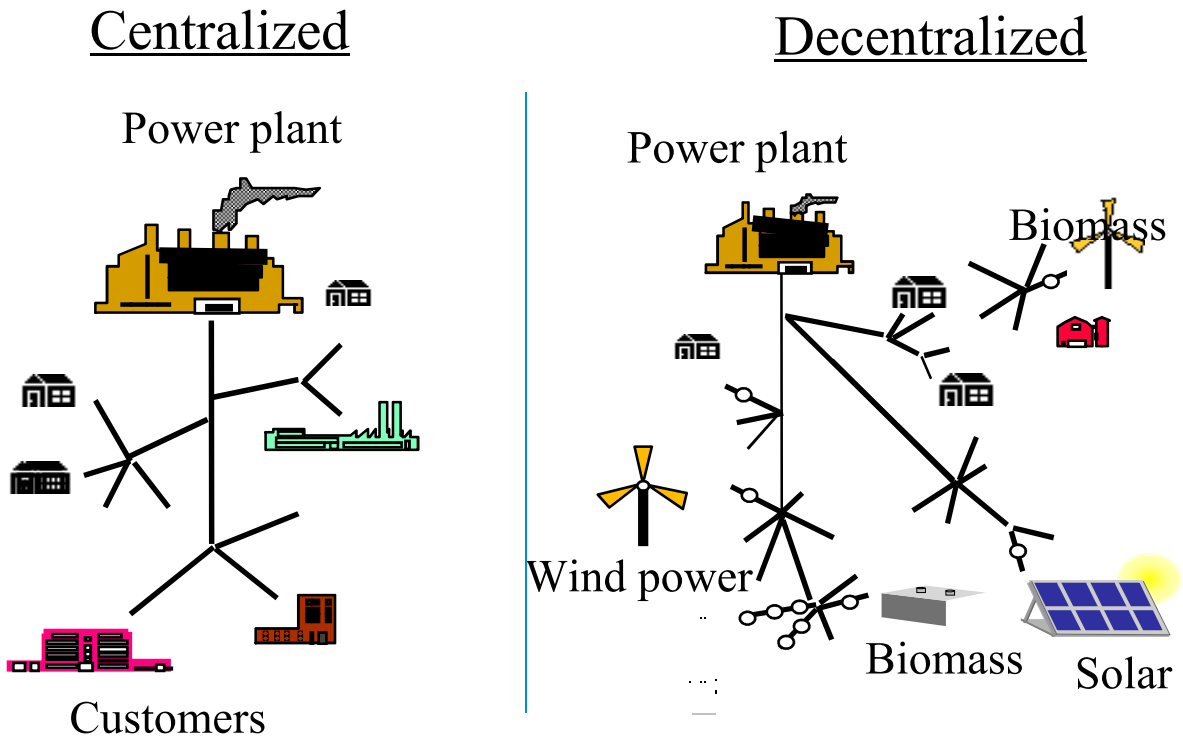
What we do

3 sectors
- Agriculture
- Renewable Energy
- Water, Sanitation and Hygiene

4 key success factors
- Inclusive development
- Systemic change
- Local ownership
- Contextualized solutions

3 roles
- Advisory services
- Knowledge networking
- Evidence-based advocacy

Centralized vs. decentralized power generation



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