



## **FRES's model for decentralized energy access in Sub-Saharan Africa**

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# Introducing FRES

## Mission

Provide electricity to rural, off-grid areas of developing countries, principally by use of solar energy.

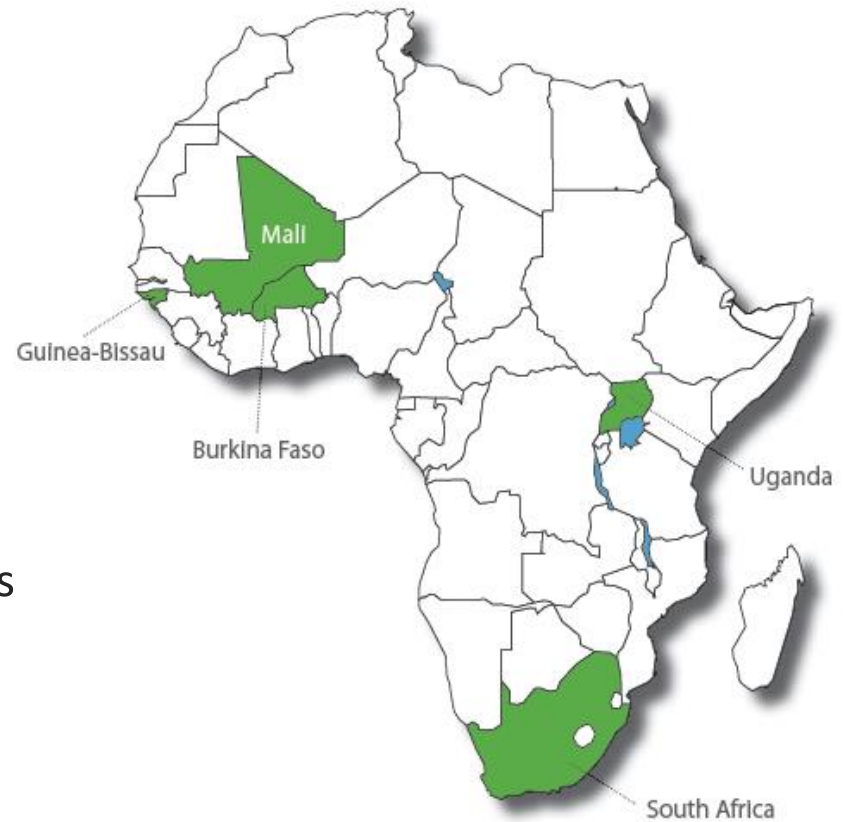
## Vision:

A multi-national network of local FRES companies throughout Sub-Saharan Africa.

## What we do:

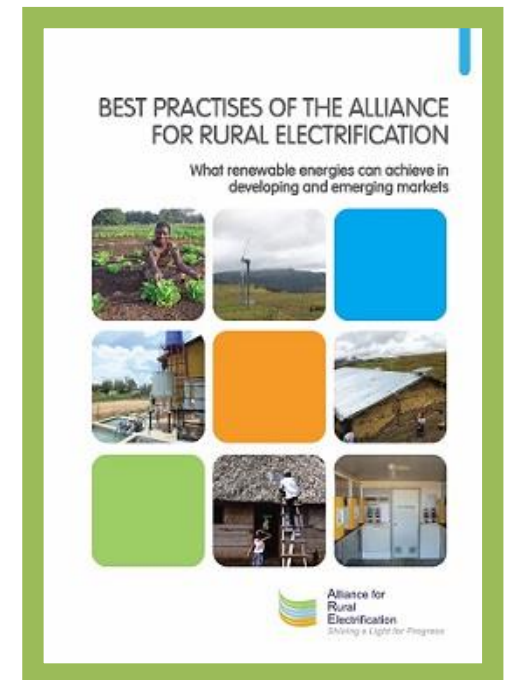
- Establish small scale utility companies
- Commercial, replicable & sustainable approach
- Focus on households & small enterprises (customers)
- Focus on productive use

Countries with FRES companies:



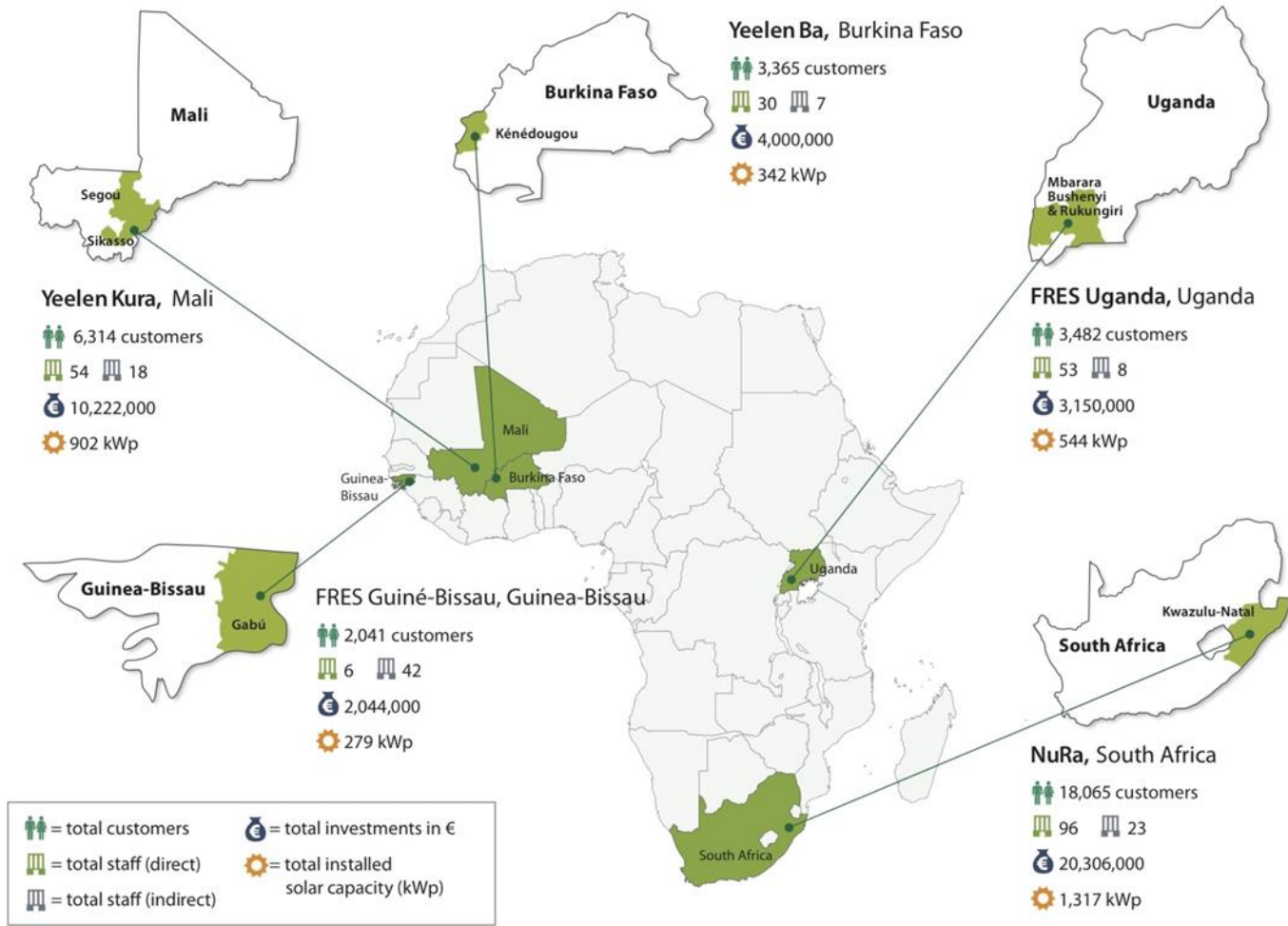
# Alliance for Rural Electrification (ARE)

- International business association representing the **decentralised energy sector** working towards the integration of renewables into **rural electrification markets in developing and emerging countries**
- Enabling improved energy access through business development support for members along the whole value chain for off-grid technologies by **targeted advocacy** and facilitating **access to international and regional funding**
- Global platform **for sharing knowledge and best practices** to provide for rapid implementation of available and advanced RE technologies and services



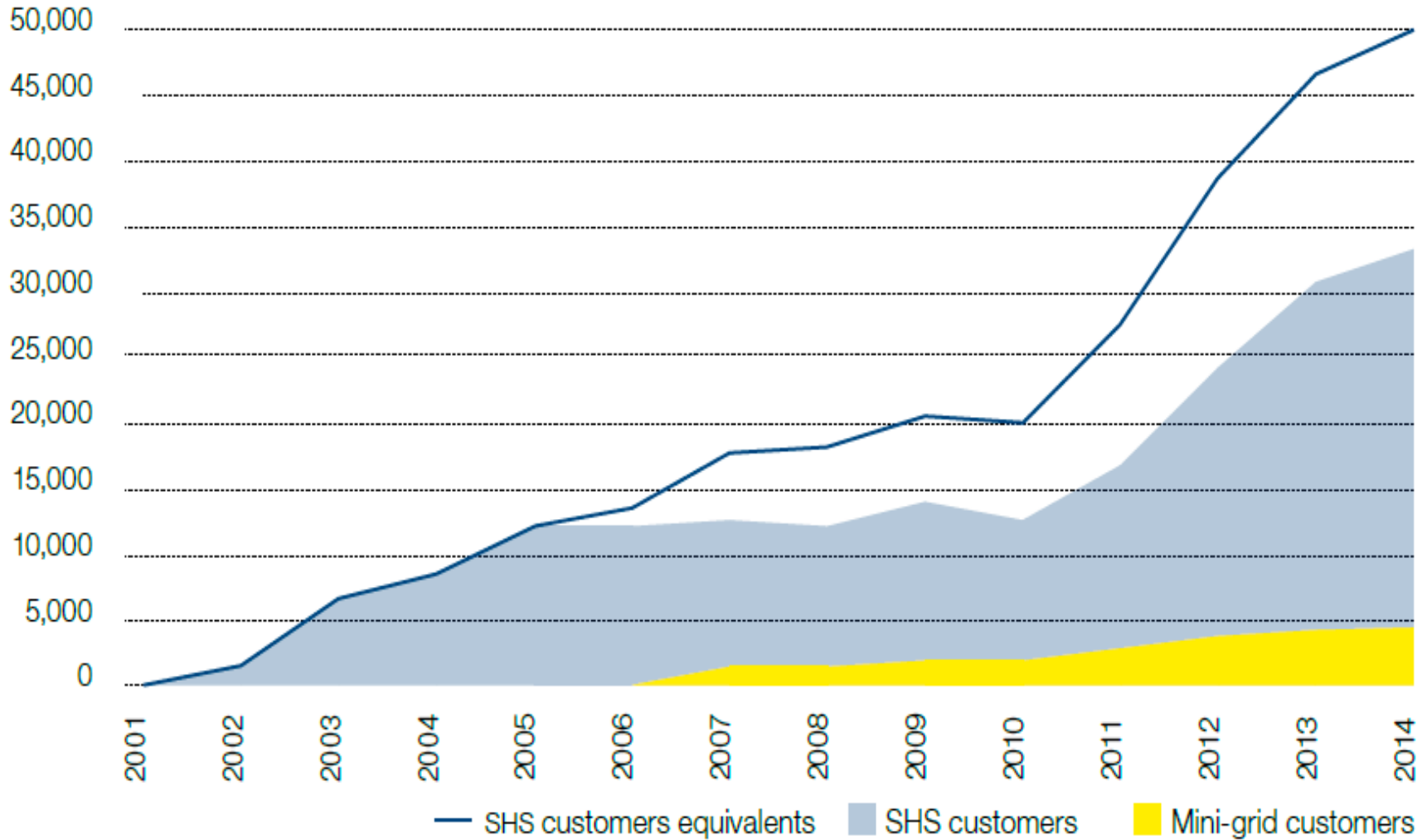
→ [www.ruralelec.org](http://www.ruralelec.org)

# Achievements to date 2001-2014

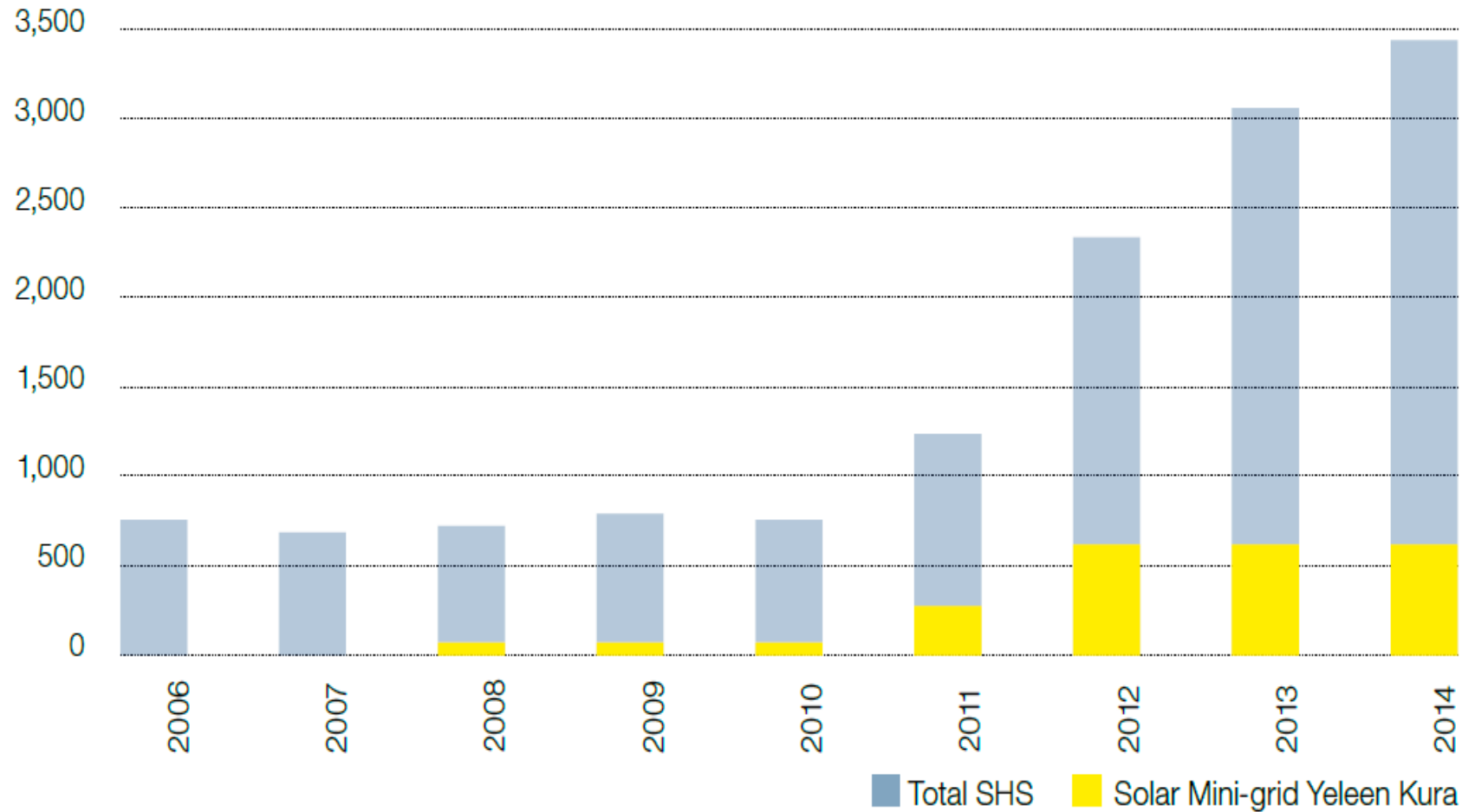


	Total customers*	Total staff (direct)	Total staff (indirect)	Total investments in €	Total installed solar capacity (kWp)
<b>FRETotal</b>	👤 33,267	👤 239	👤 98	💰 € 39,965,000	☀️ 3,384

# FRES customer evolution (2001-2014)



# Total installed solar capacity in kWp





# FRES Business Model

Fee-for-service business model that is replicable and adaptable to new regions and countries:

- Commercial local FRES companies (small utilities)
- Capital investments financed by FRES (and partners)
- Fee for Service: €6-21/month for access to (solar) electricity
- Affordable and sustainable tariff structure to cover operational expenses and replacements (batteries etc)
- Utilities in charge of installation, maintenance
- Local staff employed in rural setting



# Business phases for start-up

- Phase 1:** Pre-selection of countries based on:
- » Market-potential research;
  - » Upon requests from governments or NGOs or local communities;
- Phase 2:** Desk research
- Phase 3:** Market research
- Phase 4:** Development of business plan
- Phase 5:** Search financiers
- Phase 6:** Implementation
- Phase 7:** Monitoring and adjusting





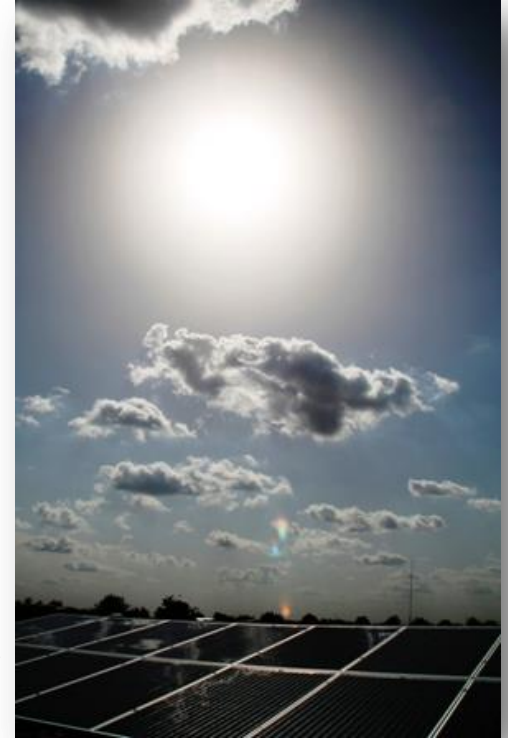
# Technologies

## Solar Home Systems

- System size: 80Wp/90Ah - 320Wp/300Ah
- Target market: households & small businesses in remote areas
- Customers: 29,000 in 5 countries (June 2015)

## Mini-grids

- System size: 50kWp / 0.8 MWh (C10) – 150kWp / 2.5 MWh (C10)
- Target market: Densely populated rural villages with diverse economic activities
- 9 mini-grids operational in Mali (2 PV, 7 hybrid and 1 diesel-only)
- 4.000 mini-grid customers (June 2015)



# Tariffs

- Balancing commercial and social drivers
  - Customer tariffs designed to be financially sustainable at scale
- Government regulation

## Solar Home Systems:

- Monthly fee of €6 - € 21 per month
- Several service levels available
- Payable in cash or via mobile banking



## Mini-grids:

- Consumption-based fee of € 0.38/ kWh
- Pre-payment
- Tariffs include provision for public lighting

# Case study : Yeelen Kura, Mali

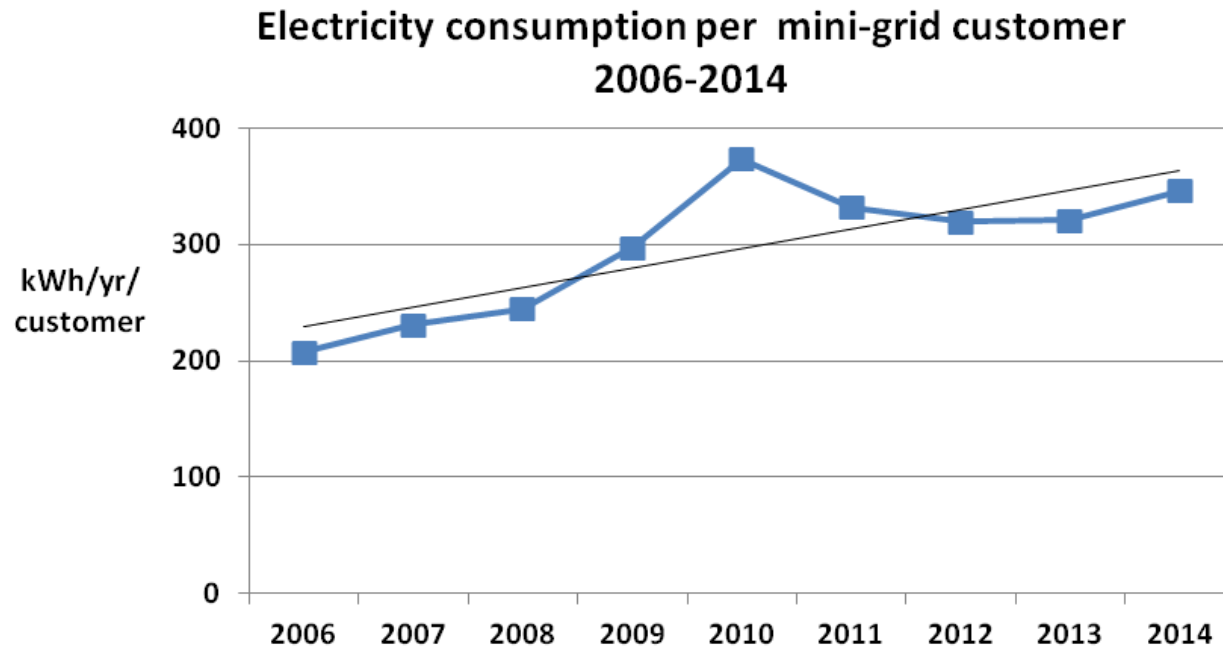
**Customers (June 2015):** 5.746  
**Staff:** 54  
**Energy stores:** 16

- Established by Nuon and EDF in 2001
  - Since 2008: FRES 80% and staff trust fund 20%
- Customer growth largest in mini-grids
- Implementing partner of Ministry of Energy/AMADER
- Ongoing tariff negotiations with AMADER
- Ongoing grid network optimisation programme



# Managing and planning for growth in demand

- 10 – 15 % growth in demand annually
- High consumption during day
- Extended hours of operation
- Active demand side management



# Success factors (1)

## **Business model:**

- Commercial, sustainable and replicable approach
- Affordable and sustainable tariff structures
- Maintenance and replacement guarantees > 20 years
- Electricity beyond basic lighting (productive-use)
- Costs effectiveness based on low operational costs , centralised procurement policy and using components with a longer lifetime (regular studies on technology developments)

## **Strong governance model:**

- Strict monitoring of performance of local companies (assessing on basis 4 business indicators)

## **Risks management:**

- Policy for managing internal and external risks (very important: benchmarking)

## **Procurement policy:**

- Centralised procurement policy, Gains from bulk purchasing, tendering strategy (good balance between technical score and price score, high quality components)

# Success factors (2)

## Local ownership:

- Local FRES companies responsible for full-cycle utility services
- Structural direct and indirect employment and ongoing training in rural setting
- Strong cooperation with / support from national governments, local authorities , community

## Strong partnerships

- Financial: (mobilise subsidies, private sector donations and sponsoring, own capital)
  - Governments of The Netherlands, South Africa, Mali and Uganda
  - European Commission
  - World Bank
  - Private companies: Nuon, EDF, Alliander (grid network company)
  - Private Public Partnership (Nuon, Government of the Netherlands, FRES)
  - NGO's (Stichting Doen, Hivos...)
- Technical:
  - Grid network company Alliander
  - GERES (Groupe Energies Renouvelables, Environnement et Solidarités)
- In kind support for organisational, legal, financial, fiscal advice from various companies :
  - PwC, Clifford Chance, Allen & Overy, Alliander, PUM...



# Challenges and lessons learnt

## Financial:

- Insufficient financing available for necessary scale-up
- Public support through co-financing grants and risks mitigation mechanisms still important
- Importance of SHS understated in global energy access mix (focus on mini-grids)

## Operational:

- Tariff negotiations
- Non-payment (technology to combat non-payment)
- Managing growth in demand
- Qualified staff in rural setting
- Few energy efficiency appliances available in the markets

## General:

- Greater transparency of national policies (such as grid extension)
- More efforts to mitigate risks related to regulatory, economical, fiscal, policy issues



# Next steps

- New FRES company in Cameroon
- Mini-grid operations to start in Guinea-Bissau
- Continuous focus on financial sustainability of local companies
- Technical and economical mini-grid performance evaluation



# Partners





# Questions ?

