RE Hybrid Grid for Thai Islands: Business Models

Key Assumptions

- Business/deployment models are **replicable**
- **Sustainable** long term operation
- **Cost recovering**
- Community **Involvement/Benefit**
- Taking in **local context**

Operator Models

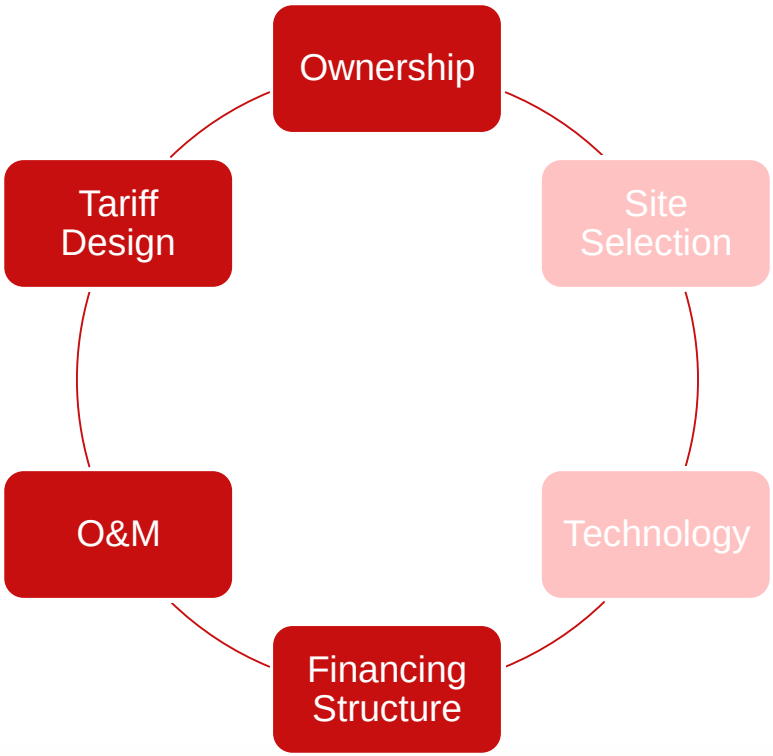
	Utility Model 1	Hybrid Model 2	Private Model 3a (Unregulated)	Private Model 3b (Regulated)	Community Model 4
Owners of power generation and distribution assets	Utility	Private/Utility/Community	Private	Private	Community
Brief description	Government or parastatal utility manages all aspects of mini-grid	Private actors generates and utility distributes the electricity, or the reverse; or private entity to commercialise electricity generated by and distributed through public assets	Private company manages all aspects, in the absence of Government regulation	Private company manages all aspects, in a regulated environment	Community members organise to manage generation and distribution in a regulated environment, with support and/or coordination from an NGO or private company
Pros	▸ Can absorb funds easily; ▸ Less regulation needed; ▸ Connection of mini-grid to main-grid can be easier; ▸ Cross-subsidisation of tariffs, thus affordability easier ensured; ▸ Aim to fulfil national electrification aims	▸ Different actors contribute their strengths, technical and management know-how; ▸ Scalable, profitable; ▸ Less conflict potential with customers in case of distribution by utility with cross-subsidised tariffs.	▸ Commercial sustainability creates incentives for long-term operation; ▸ Ability to act fast without government interference; ▸ Profitability ideally allows for scaling up of operations	▸ Scalability through private capital; ▸ Technical know-how, high reliability; ▸ Profitability ideally allows for scaling up operations; ▸ Legal security of regulated market attracts private finance	▸ Self-managed public infrastructure; ▸ Less conflict potential with customers and officials; ▸ Creating assets and local ownership; ▸ Enabling self-determination and economic development

	Utility Model 1	Hybrid Model 2	Private Model 3a (Unregulated)	Private Model 3b (Regulated)	Community Model 4
Cons	▸ Not the core business; ▸ Unsuited company structure for smaller projects; ▸ Strain on limited budget; ▸ Political interference; ▸ Possibly corruption in procurement;	▸ Complex management, feasibility of models depend on regional/local context/structures; ▸ Non-fulfilment of contracts due to conflicts between business partners; ▸ Insolvency of one partner (either SPD or SPP) puts full operator model at risk	▸ No financial support from public obtainable; ▸ Grid interconnection challenging/impossible; ▸ Changes in regulation and fixed tariffs can reduce profitability; ▸ Conflicts with customers due to monopoly; ▸ Insufficient quality and safety risks of service can occur if it is not supervised, which can contribute to a bad image of mini-grids	▸ Reliable regulation needed, dependency on lengthy approval procedures; ▸ Debt financing needed for scaling up; ▸ Vulnerable to changes in regulation, fixed tariffs, conflict with customers; ▸ High transaction costs; ▸ Potential risk: grid interconnections	▸ Insufficient local human (technical and management) capacity; ▸ Often unclear ownership structure; ▸ Usually high grants needed; ▸ Tariffs not covering operation and maintenance (O&M) and reinvestment costs; ▸ Corruption risk due to overlapping of management and social and family connections

Source: Mini-grid Policy Toolkit

Business Model Components

Four components are assessed for each deployment model:



Stakeholders Definitions

Community

Local People Resorts

Local Businesses

Utility/Public

PEA SAO

MoEN

Financing

Private Investor

Donor Public org.

Banks Equity

Technical

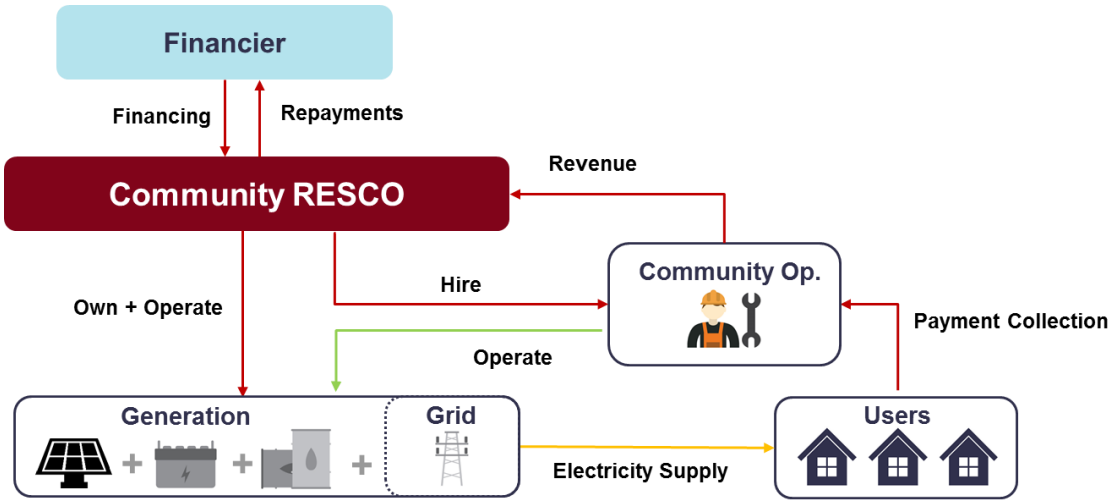
EPC GIZ ILF

Project Developer RF

Potential Models for Koh Bulon Don

1. Community Model: RESCO
2. Community Model: RESCO via Revolving Fund
3. Utility Model: SAO invest
4. Hybrid Model: Concession with SAO

Community Model: RESCO



Pros

- Reduced risk of conflict with users
- Full retainment of revenues in the community
- Can start immediately using existing channels

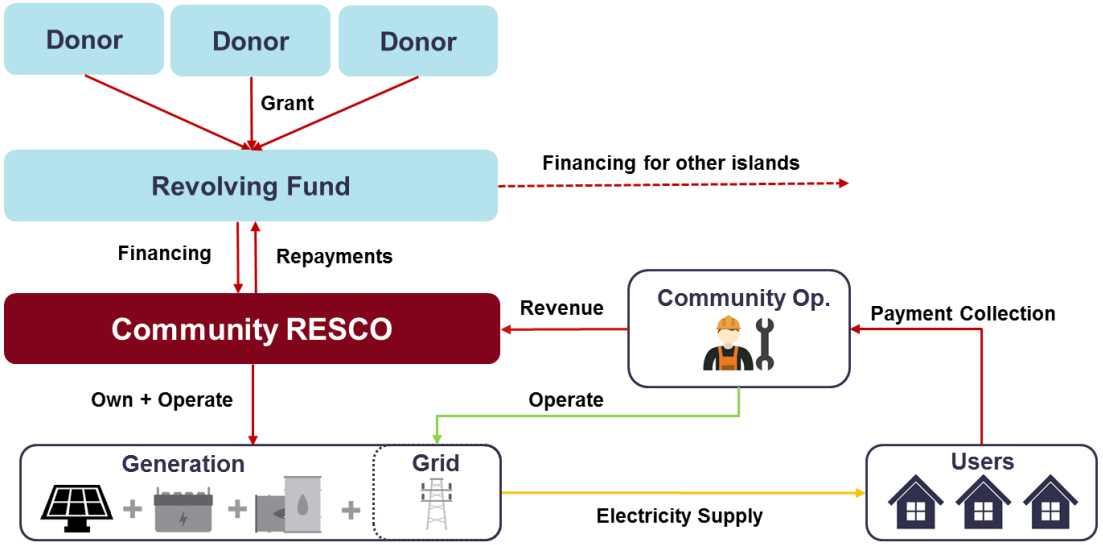
Cons

- Difficult to find commercial financing
- Community have to take liability of repayments
- Risk of defaults

Key success factors

- Strong community commitment and leadership
- Community sees benefit in owning the assets
- Getting the right financier

Community Model: RESCO via Revolving Fund



Pros

- Possibly lower cost financing
- Long term financing + technical support
- Revolving fund can be used to finance other islands

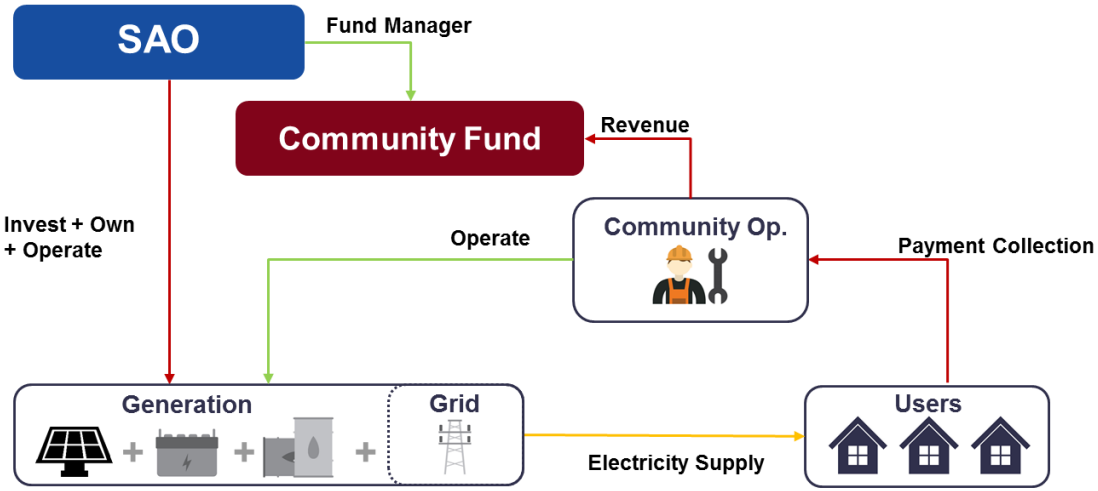
Cons

- Complexity and timeframe in setting up a revolving fund
- Long term management of revolving fund (More than 10 years)

Key success factors

- Revolving fund is well managed (possibly backed by Ministry of Energy)
- Long term repayment to the revolving fund is ensured

Utility Model: SAO invest



Pros

- No new organizational structure is needed
- No-low land use conflict
- Revenues can be retained in the community via a fund

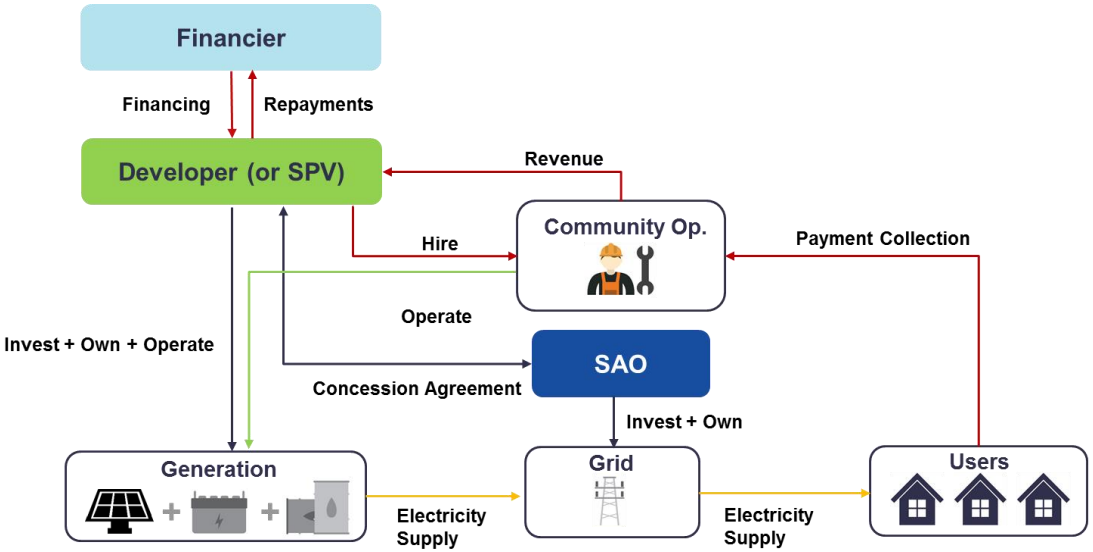
Cons

- Long decision making process
- Budget availabilities
- Technical expertise lacking
- No drive to ensure long term operation

Key success factors

- SAO sees the benefit and takes initiative
- System is procured as designed

Hybrid Model: PPP Model (Concession with SAO)



Pros

- SAO grid assets are utilized
- Developer get access to land
- SAO is in the loop to buffer potential conflict with community

Cons

- Complexity of setting up concession structure/PPP

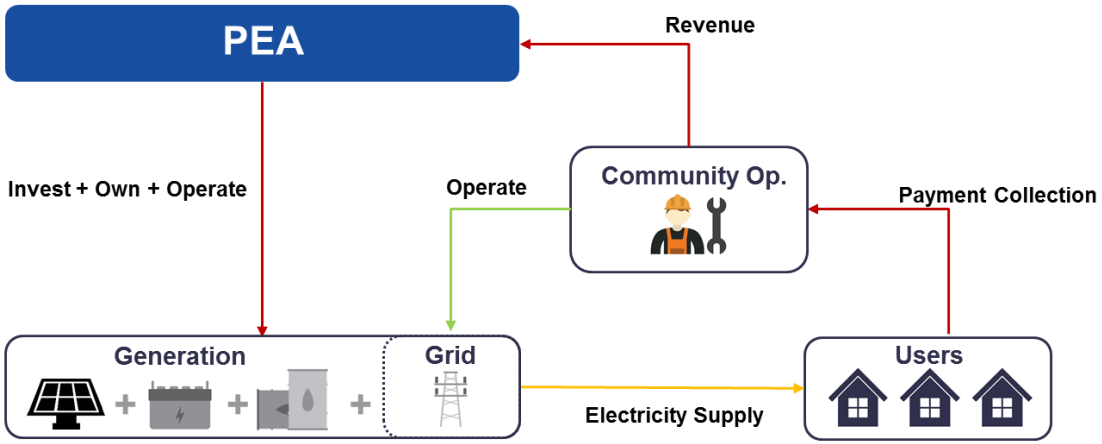
Key success factors

- SAO is taking initiative and supportive

Potential Models for Koh Mak Noi

1. Utility Model: PEA Invest
2. Private Model: Developer
3. Hybrid Model: JV
4. Hybrid Model: PPA Model

Utility Model: PEA Investment (Alternative to Cable)



Pros

- Lower CAPEX and higher return than cable
- Increase utility's coverage and revenue
- Professional grid that complies to main grid standards

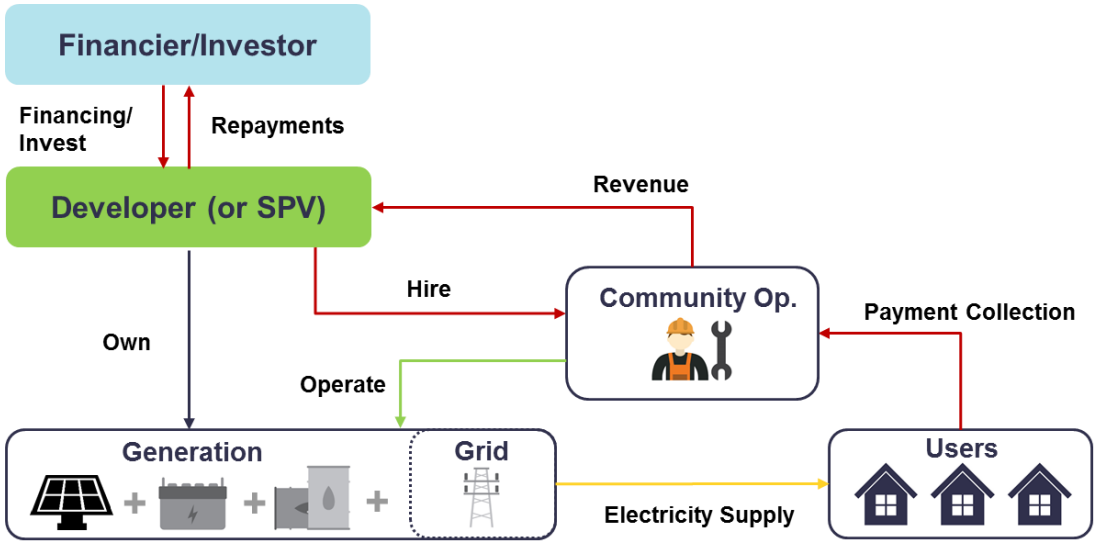
Cons

- Can be slow in decision making and deployment
- Community involvement/benefits may be low
- Risk of political influence

Key success factors

- PEA is convinced of the higher benefits
- Decision makers approve of the concept

Private Model: Developer



Pros

- Fast deployment and scalable
- Long term operation is ensured via cost recovery
- Model is commercially sustinable

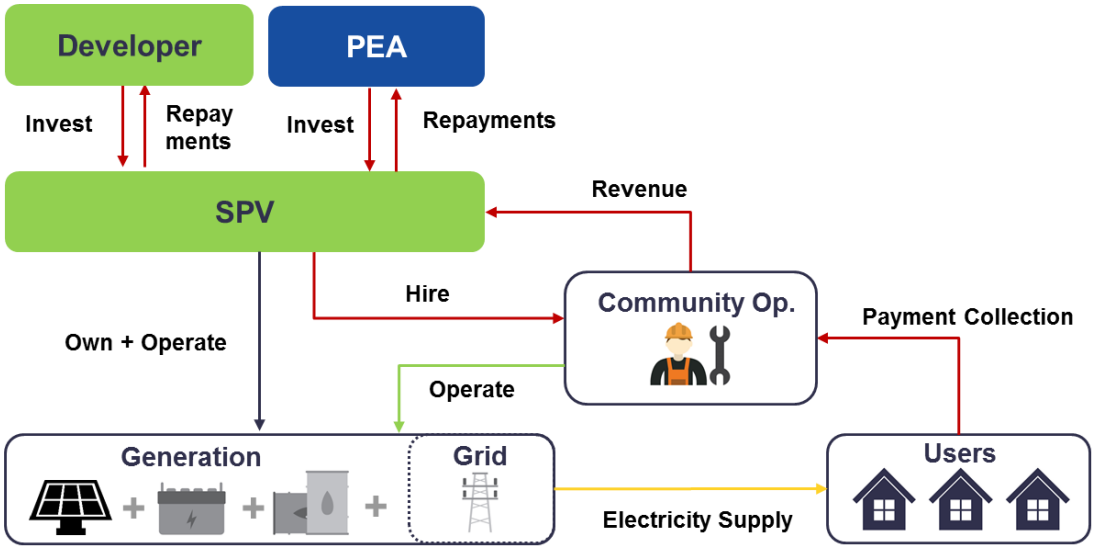
Cons

- Risk of conflict with users in payment collection
- Risk of regulation changes
- Returns may not meet investor‘s requirement

Key success factors

- Developer and community (head or committee) relationship is well maintained
- Tariffs are transparent and communicated at the start

Hybrid Model: JV Model



Pros

- Strengths of each party are utilized
- Higher community acceptance via PEA name
- Risks are shared between the parties

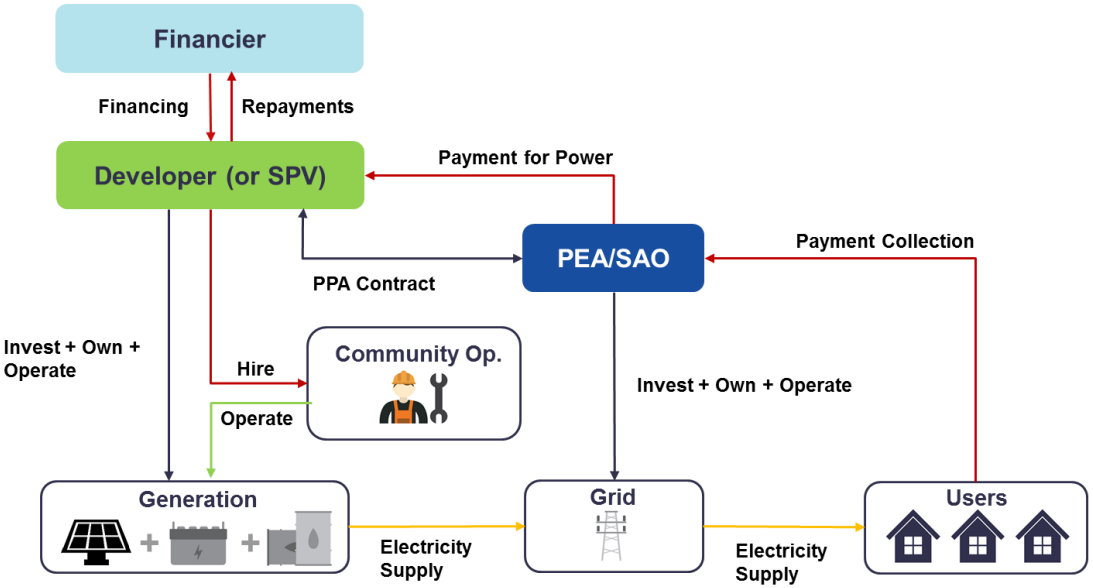
Cons

- Negotiations and decision may be a long process
- Conflict of split decisions
- Revenues are shared
- Risk of regulation change

Key success factors

- Developer and PEA are able to agree on JV

Hybrid Model: PPA Model



Pros

- PEA operate its core business
- Developer does not need to deal with payment collection

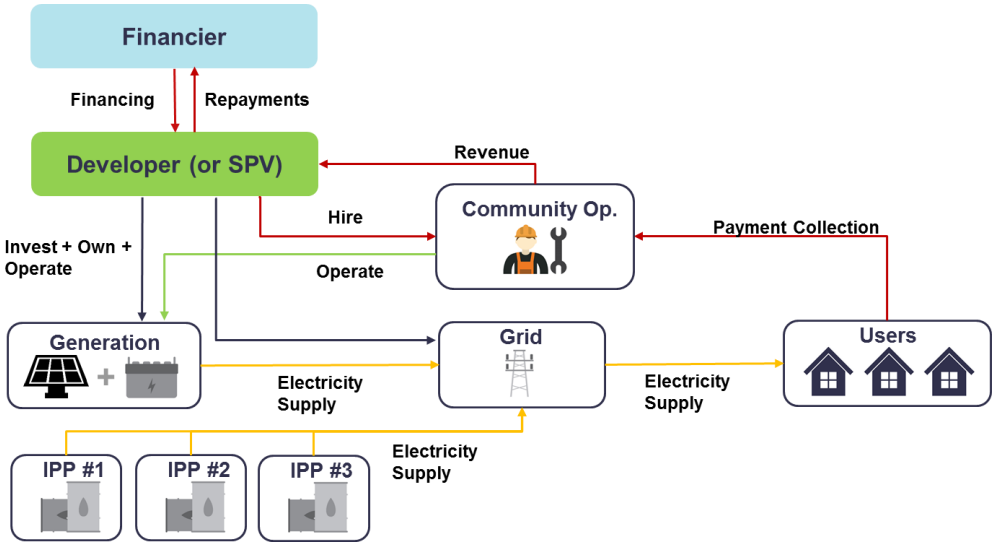
Cons

- May pose legal/policy challenges
- Decision making and budget availabilities on PEA side
- Risk of regulation change

Key success factors

- Developer is able to deliver based on the PPA contract

Hybrid Model: Grid with community IPP



Pros

- Diesel operators are included in the system
- No stranded assets

Cons

- Highly complex operation
- Risk of IPP not be able to deliver

Key success factors

- Design of system and operation commands