

# Renewable Energy project Development, Finance and Business Planning

**Main steps for RE project development**

3-4 May 2016, Rabat, Morocco

**Rafik MISSAOUI**



# Content



- Project development and implementation process
- Project identification
- Assessing of potential sites
- Project development
- Project Financing
- Project Implementation
- Project Operation
- Decommissioning

# Project development and implementation process

- Long-term projects
- The process of developing a RE project should follow 8 main phases :





# Phase1: Identify the project idea



<b>1. Fix the objectives</b>	<b>The reason of the project:</b> <ul style="list-style-type: none"><li>• Become more energy self sufficient</li><li>• Reduce energy bills</li><li>• To protect against energy price increases</li><li>• Sell energy and make money</li><li>• Own the means of energy production ...</li></ul>
<b>2. Analyse the general framework of the project</b>	<ul style="list-style-type: none"><li>• Policies related to investment and renewable energy</li><li>• Financial incentives</li><li>• RE Support Mechanisms: FIT, Net Metering...</li></ul>
<b>3. Select the RE technology</b>	<b>Factors of selection:</b> <ul style="list-style-type: none"><li>• Type of energy needed (electricity, heat)</li><li>• Availability and type of local renewable resources</li><li>• Maturity and competitiveness of RE technologies</li></ul>



## Phase1: Identify the project idea (2)



<b>4. Stakeholder analysis</b>	<ul style="list-style-type: none"><li>• Identification of the parties involved in the project / Communication</li></ul>
<b>5. Select a site</b>	<ul style="list-style-type: none"><li>• Identification the site(s) suitable with the selected RE technology d (keys: location, quality of renewable resources, access, grid connection ...)</li></ul>
<b>6. Initial assessment of project viability</b>	<ul style="list-style-type: none"><li>• First estimation of the cost of the project and the amount of energy likely to be generated</li></ul>

## Phase 2: Assess potential sites

<b>1. Establish a legal entity</b>	<ul style="list-style-type: none"><li>• <b>Constitute a legal entity taking the project forward</b></li></ul>
<b>2. Secure initial funds</b>	<ul style="list-style-type: none"><li>• <b>Identify funding options to support pre-feasibility work</b></li></ul>
<b>3. Pre-feasibility study</b>	<ul style="list-style-type: none"><li>• <b>Assess the site(s) and the technology options suitable :</b><ul style="list-style-type: none"><li>• <b>Annual energy yield and estimated income.</b></li><li>• <b>Environmental constraints.</b></li><li>• <b>Initial estimates of capital, operations and maintenance cost</b></li></ul></li></ul>
<b>4. Pre-planning consultation</b>	<ul style="list-style-type: none"><li>• <b>Discuss with the planning authority to have a clear picture of the project</b></li></ul>



## Phase 3: Evaluate the project



<b>1. Secure the site</b>	<ul style="list-style-type: none"><li>• Obtain legal agreements for the use of the site where the project is to be installed.</li></ul>
<b>2. Full feasibility study</b>	<ul style="list-style-type: none"><li>• Assess the technical, financial and regulatory viability.</li></ul>
<b>3. Confirm grid available</b>	<ul style="list-style-type: none"><li>• Investigation of solutions to overcoming grid constraints .</li></ul>



## Phase 4: Develop the project



<b>1. Fix the project size</b>	<ul style="list-style-type: none"><li>• <b>Fix the size of the project using the results of feasibility study, planning consultation and grid enquiry</b></li></ul>
<b>2. Financial viability check</b>	<ul style="list-style-type: none"><li>• <b>Confirm the project remains financially viable</b></li></ul>
<b>3. Planning application</b>	<ul style="list-style-type: none"><li>• <b>Prepare and submit a Planning Application for the project</b></li></ul>





## Phase 4: Develop the project (2)



<b>4. Grid application</b>	<ul style="list-style-type: none"><li>• Make a formal grid application .</li></ul>
<b>5. Identify funding sources</b>	<ul style="list-style-type: none"><li>• Achieve capital funding through capital loans or capital grants or other finance arrangements .</li></ul>
<b>6. Develop full financial model</b>	<ul style="list-style-type: none"><li>• Complete a business plan and detailed financial appraisal with full project costs and projected incomes to take to potential funders.</li></ul>



## Phase 5: Getting to financial close



<b>1. Identify &amp; contact suppliers</b>	<ul style="list-style-type: none"><li>• Choose suppliers of equipment and services (directly , competitive tenders ) / contracts can be formalised and programmed</li></ul>
<b>2. Secure bridge funds</b>	<ul style="list-style-type: none"><li>• Identify if further funding is required prior to financial close.</li></ul>
<b>3. Pre-accreditation</b>	<ul style="list-style-type: none"><li>• Apply for a pre-accreditation to sell energy produced</li></ul>
<b>4. Financial Close</b>	<ul style="list-style-type: none"><li>• Using the detailed financial appraisal previously completed with a finance model, it should be possible to secure the project finance.</li></ul>



## Step 6: Implement



Post Financial Close, confirm all orders and contracts and the process of equipments delivery, installation and connection can take place.



## Step 7: Operate



- Ensure the day to day operation and maintenance
- Ensure management is in place for the life of the project for collecting and distributing income and meeting operating, financial and other liabilities.



## Step 7: Decommission



RE project equipments must be removed at the end of the productive life (generally 20 to 25 years) or when at the point where they are no longer used.



Thanks

# Renewable Energy project Development, Finance and Business Planning

How to prepare a business plan ?

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**Rafik MISSAOUI**



# Content



- Summary of the business plan
- Description of the developer profile
- RE market analysis in the country
- Project description
- Financing plan
- Financial and economic analysis
- Risk management
- Environmental and other benefits





## General consideration



- To whom the document is intended for ?
  - Lenders
  - Shareholders
  - Investment funds (private fund, capital risks, etc.)
- It must be written in a simple, clear and accurate language
- It should be short, but self sufficient document
- No need to include non useful information for the target
- It is a confidential document



## **Main content**

# **Summary of the business plan**



**1 to 2 pages, well written**

- What are the main features of the project ?
- How the project meets the developer needs ?
- What is the potential opportunity?
- How much is the investment cost of the project ?
- How you will finance the project ?
- What it is the profitability of the project and the likely benefits that will provide



## **Main content**

# **Description of the developer profile**



### **2 to 3 pages**

- Who is the project owner or developer?
- Where is the developer located
- What is his/her business?
- What are his/her skills in relation with the project?
- Some figures on his/her historical activity?
- What are the strengths regarding the project?
- Financial solidity proof of the developer



## **Main content**

# **EE and RE market analysis in the country**



### **1 to 2 pages**

- Energy context of the country (relevant for the project)
- Local energy prices and the perspective of their evolution
- Legal framework in relation with the project
  - RE Laws
  - Particular requirements, etc.
- Public incentive policy to RE and any other source of support to RE projects



# **Main content**

## **Project description**



### **4 to 5 pages**

- Project objective
- Description of the technical solution adopted by the project
- Description of the used technology
- The implementation planning of the project
- Who and how the implementation will be made
- The strategy for the project operation and the means to be provided
- Project lifetime
- Evaluation of the final energy saving or produced by type of energy (electricity, gas, fuel, etc.)



## **Main content**

### **Financing plan**



#### **2 to 3 pages**

- The investment cost details by component and distinguishing the local and the imported part of the procurements
- The financing strategy available options and the selection of the most appropriate one
- The proposed financial scheme of the project (equity, debts, etc.).
- The terms of the debts, mainly the interest rate, reimbursement period and grace period.
- The presentation of the shareholders, other than the developer, if any.



## **Main content**

# **Financial and economic analysis**



**8 to 10 pages**

- Forecast of the operation costs of the project
- Forecast of the energy bill saving, with clear presentation of the assumption of calculation
- Forecast of the project cash-flow over the project period
- The financial profitability by presenting the main profitability ratios of the RE project, such as Net Present Value, Payback, Interest Rate of Return, Profitability Index.
- Sensitivity analysis of the profitability regarding the critical assumptions to check the robustness of the project
- Project solvency

# Main content

## Risk management

### 1 to 2 pages

- What are the main risks of the project?
- What is your strategy to mitigate the identified risks?
- Risk mapping

Risks	Mitigation strategy
<b>Technical Risks</b>	
Construction risk	
Technology risks	
Operation risk	
Changes of initial parameters	
<b>Commercial risks</b>	
<b>Sovereign risks</b>	





## **Main content**

# **Environmental and other benefits**



**2 to 3 pages**

- Primary energy savings
- National energy bill reduction
- Energy subsidy savings for the State
- Job creation
- CO<sub>2</sub> emission mitigation
- Other social and environmental benefits (empowerment of vulnerable groups, etc.)



Thanks

# Renewable Energy project Development, Finance and Business Planning

Criteria and requirements of financial institutions

3-4 May 2016, Rabat, Morocco

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## Content



- Project documentations required by the financial institutions
- What the financial institution want to examine? :  
Creditworthiness appraisal

# Project documentations required by the financial institutions

## Financial Information on the Applicant

- Letter of Intent
- Applicant's audited financial statements for past three years (if available)
- Tax return for the last three years.
- Financial Analysis Report that indicates the financial health of the applicant:
  - current assets/current liabilities;
  - long-term debt ratio (total long-term debt/(total long-term debt + shareholders equity));
  - Debt to equity ratio (total liabilities/(total liabilities + shareholder debt))
  - Debt coverage ratio (annual cash flow before interest and taxes / the interest and principal payment), etc.
- Information relating to creditworthiness such as assets for collateral and any credit guarantees.



# **Project documentations required by the financial institutions**

## **Project documents**



- Business Plan document
- Technical feasibility study
- Financial feasibility study
- Environment and Social Impact Study, if required
- Legal authorization and licenses
- Any other relevant documents for the project, such as Partnership agreements, etc.



## What the financial institution want to examine? : Creditworthiness appraisal

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- The main objective of a financial institution is to minimize its risk regarding the loan provided to the developer.
- This risk can be either linked **to the project** and / or **to the borrower** (developer)
- From a financial institution's point of view, conducting a proper evaluation of the borrower is the most important part of the overall renewable energy project appraisal.
- No matter how strong an investment project may be from a technical and financial point of view, lenders will always want to check the **overall creditworthiness** of the potential borrower.



# What the financial institution want to examine? : Creditworthiness appraisal Borrower (developer) evaluation



## The 5 « C »

- **Capacity** : refers to the ability of the developer (from technical, financial and managerial point of view) to run the business and to return the loan.
  - How the developer intend to repay the loan?
  - Cash flow from the business and timing of the repayment
  - Probability of successful repayment of the loan.
  - Contingent sources of repayment.
- **Capital** : refers to the long term sustainability of the developer company and of its sources of finance.
- **Collateral**: refers to the strength and safety of the proposed security package in case the anticipated means of repayment failed (cash flow lower than expected).





# What the financial institution want to examine? : Creditworthiness appraisal Borrower (developer) evaluation



- **Conditions** primarily focus on the intended purpose of the loan (will the money be used for working capital, additional equipment, or inventory) and concomitantly on the market and how the company performs in the market.
- **Character:** The lender will review the integrity of the business and its management and form a subjective opinion as to whether or not you are sufficiently trustworthy to repay the loan or generate a return on funds invested in your company.



# What the financial institution want to examine? : Creditworthiness appraisal Project appraisal



## ■ Technical Appraisal

- Are the projected energy produced or saved realistic? Are the basis of calculation appropriate?
- Which technology will be used for the RE project? Is this a proven technology or an innovative and therefore more risky one?
- Are there any drawbacks, such as impact on production or production schedules during implementation of the investment project?
- Is there a need for environmental clearance?
- Legal due diligence to ensure that all licenses, permits and clearances were obtained and that the loan agreement and security package are in accordance with the bank's standard lending procedures.



# What the financial institution want to examine? : Creditworthiness appraisal Project appraisal



## ■ Financial Appraisal

- Project profitability
- Solvency
- Robustness of the assumptions, etc.

## ■ Legal Appraisal

- Availability of required licenses, permits and clearances
- Compliance of loan agreement and security package with the bank's standard lending procedures, etc.

## ■ Environmental Appraisal

- Consistence of the environmental impact evaluation
- Compliances with the national requirements
- Is there a need for environmental clearance?



Thanks

# Renewable Energy project Development, Finance and Business Planning

**Main business models of RE projects**

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# Content



- Definition
- Business Model Canvas Tool
- Business Model Attractiveness
- Examples of Business Models for RE
- Feed-in based business model
- On-bill Financing Business Model

# Main business models for RE Projects

## Definition

- A Business Model is a framework for creating value. It explains how the company is doing its business: purpose, offerings, strategies, infrastructure, organizational structures, trading practices, and operational processes and policies.
- The business model canvas gives any company a simple and intuitive tool to describe and think through the different elements of its business models in order to systematically challenge the way it does business and thereby be able to create new strategic alternatives.
- The canvas tool: Nine basic building blocks covering four main areas of a business: customers, offering, infrastructure, and financial viability (Osterwalder 2004).



# Main business models for RE Projects

## Business Model Canvas Tool



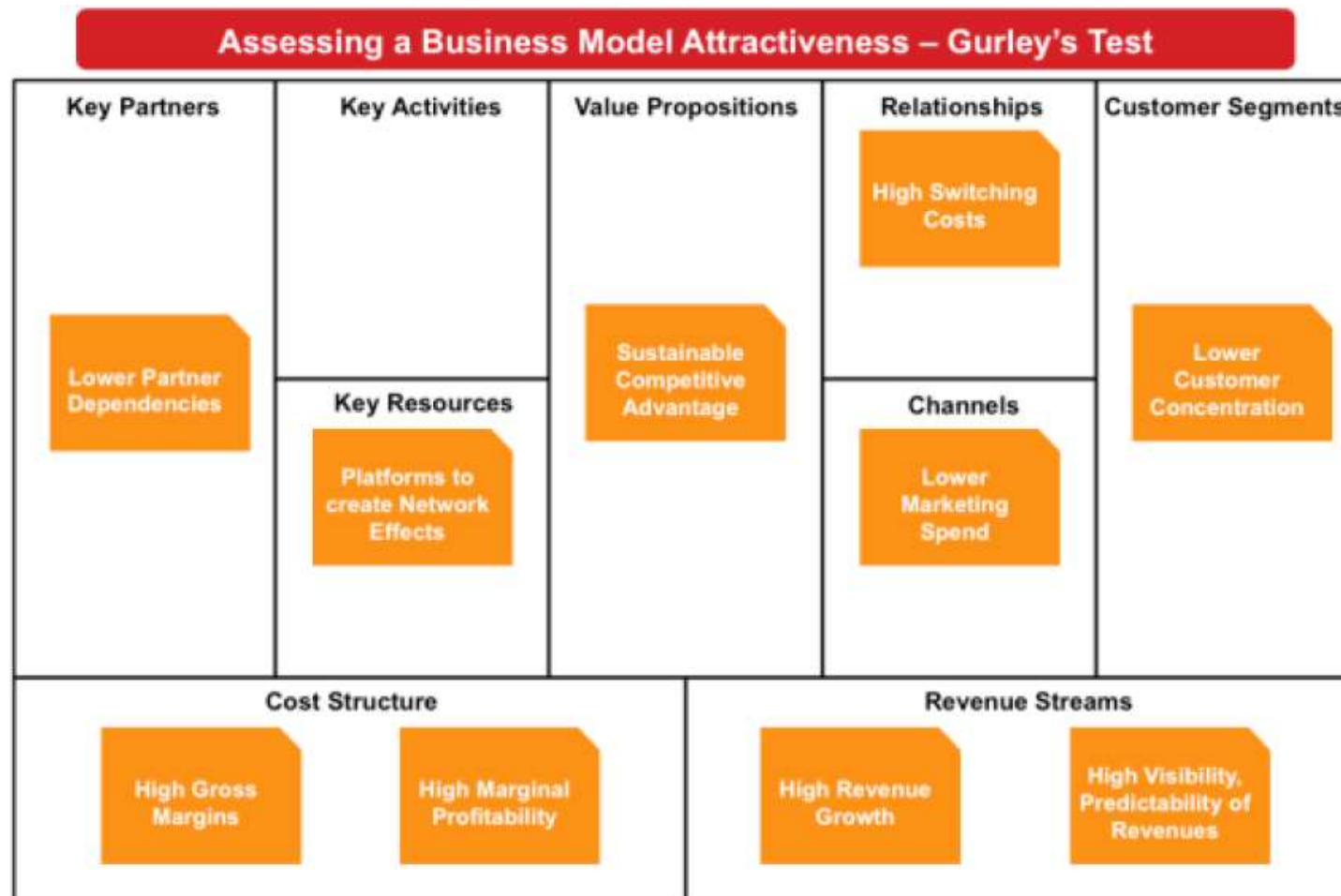
- 1. Customer Segments** - the different groups of people or organizations that the company aims to reach and serve by its products or services.
- 2. Value Propositions** - the bundle of products and services that create value for a specific Customer Segment.
- 3. Channels** - how a company communicates with and reaches its Customer Segments to deliver a Value Proposition.
- 4. Customer Relationships** - the types of relationships a company establishes with specific Customer Segments.
- 5. Revenue Streams** - the cash a company generates from each Customer Segment
- 6. Key Resources** - the most important assets required to make a business model work
- 7. Key Activities** - the most important activities a company must do to make its business model work
- 8. Key Partnerships** - the network of suppliers and partners that make the business model work
- 9. Cost Structure** - all costs incurred to operate a business model



# Main business models for RE Projects

## Business Model Attractiveness

**Gurley's Test** : method to evaluate a successful business model



# Main business models for RE Projects

## Examples of Business Models for RE

- **Power Purchase Agreement Model – Corporate**
- **Power Purchase Agreement Model – Residential**
- **Community wind/solar models:** multiple local owner model, the flip model, consumer cooperative model and municipal ownership model, local owner co-operative model
- **Multi-party Ownership models**, e.g. for anaerobic digesters (Dual Ownership Model, Community Digester model)
- **Third Party Ownership model** (Utility Ownership model, Private Sector Ownership model, Cooperative Ownership model)

# Main business models for RE Projects

## Business Models for RE (2)

- **Project Aggregation model**
- **Renewables-as-Appliance models** (Retailer Sales model, Standardized Configuration model)
- **Environmental Credit Market models** (Renewable Energy Credit Market model, Carbon Offset Market models, Emissions Allowance Market models)
- **Energy Service Contract Model**, e.g. for geothermal heat pumps

# Feed-in based business models

## Description

- A feed-in scheme is a policy by which the producer of renewable energy receives a direct payment per unit of energy produced.
- This feed-in remuneration can be a tariff, which like a preferential price covers the full generating costs, or a premium, which provides a 'bonus' for the producer to cover the financial gap between the generation costs of using RE versus using conventional (fossil) energy.
- A feed-in scheme guarantees access to a predictable and long-term revenue stream, which can serve as a stable basis for a business model.
- Feed-in schemes have been used by companies and investors as a **basis for business models** for large scale power production (e.g. wind parks or biomass plants), as well as by households and small and medium enterprises who want to generate their own energy using renewable sources.



# Feed-in based business model

## Market segments



- Feed-in based business models are applicable for all market segments: new and existing buildings, public, commercial/industrial and residential buildings.
- Notably, in the domestic building segment, a feed-in scheme may provide opportunities for entrepreneurs who use demand aggregation (e.g. through district heating or by providing energy services to groups of customers).
- Which market segments are eligible for feed-in support, and therefore can be part of a business model depends on the policy specifics in the country or region.

# Feed-in based business model

## Actors

- The two main actors in a feed-in scheme are the institution that makes the payment available (government, network operator) and the recipient (home owner, building manager, or energy service company).
- The payment can be executed through a government agency, the energy supplier, or through the network operator.
- Payment in many instances is based on certificates, or 'guarantees of origin', in which case a government agency or certified third party company will be involved in verifying production and issuing certificates.
- If tariff levels are based on category specific generation costs, an (independent) institute may be involved in advising government on costs.

# Feed-in based business model

## Organisational and financial structure

- A feed-in scheme is a policy, and the tariffs are therefore fixed by the government.
- The cost of this support is either recovered from the government budget (i.e. from tax payers), or from a network operator mark-up on energy bill.
- A feed-in scheme typically publishes rates per energy unit for eligible production . If a **producer is eligible**, a contract (or agreement) can be obtained from the government which allows the producer to claim the specific tariff (or premium) for every unit produced.
- Some feed-in schemes cover only energy that is delivered to the grid, whereas other schemes also cover autoproduction (using generated energy for own purposes) : **Net-metering**



## **Feed-in based business model**

### **Organisational and financial structure (2)**

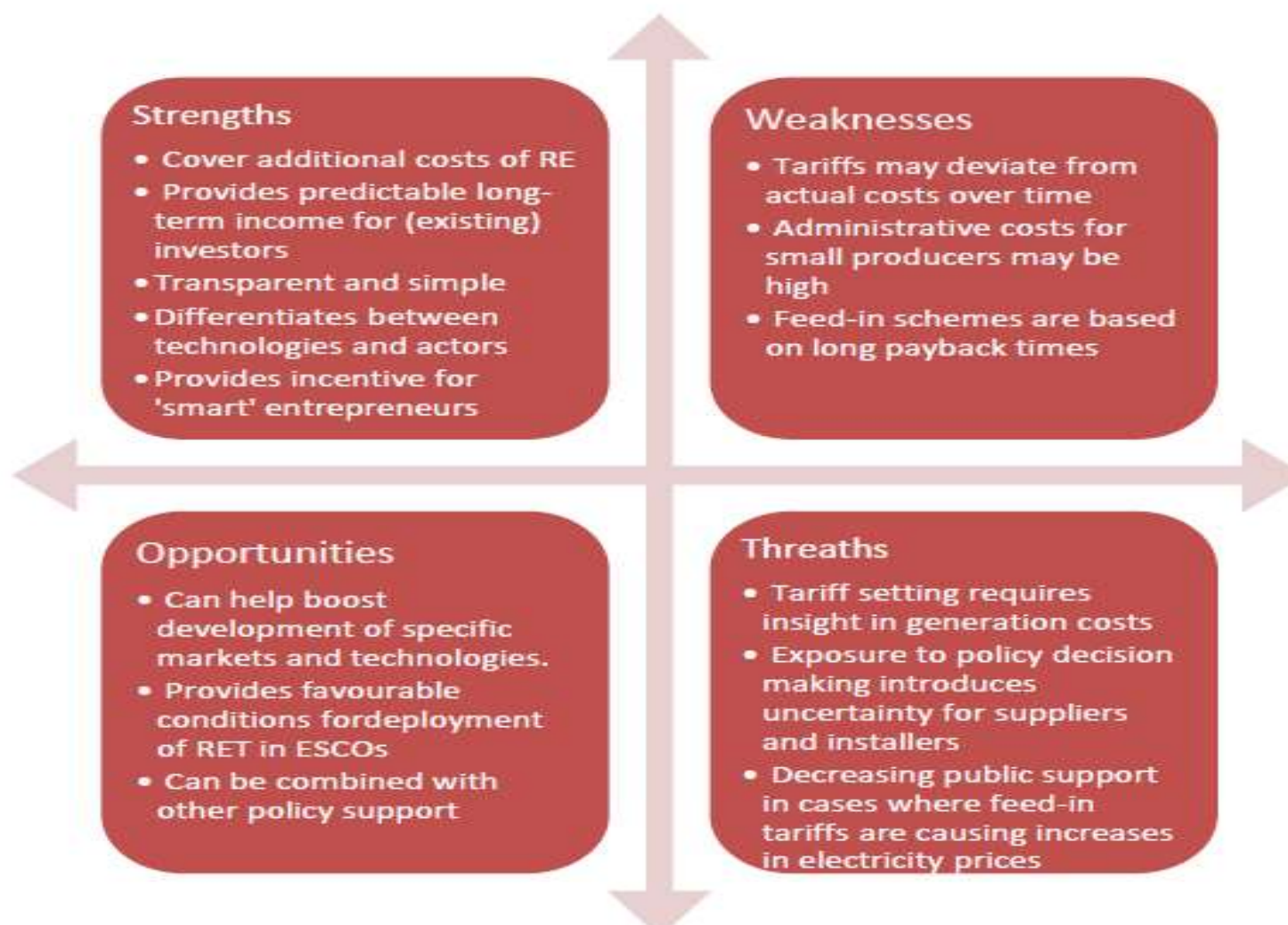


- Feed-in schemes do not look at specific projects and real costs, but instead use cost estimates per category.
- To build a viable business model based on a feed-in scheme, the investor has to undertake a careful assessment of the project economics taking into consideration climate conditions, technology costs, and fuel prices (e.g. prices of biomass)
- The main advantage of a feed-in based business model is that it has a predictable and stable long-term cash flow
- Investors may combine the use of a feed-in scheme with other available support mechanisms such as soft loans or fiscal incentives to improve the financing conditions.



# Feed-in based business model

## SWAT Analysis





# On-bill Financing Business Model

## Description

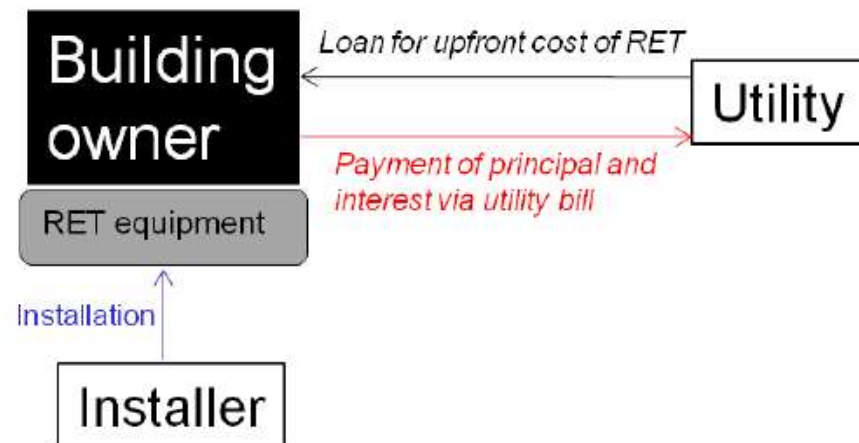


- In this business model, utilities provide financing (a loan) to the building owner who repays this loan via a surcharge on its utility bill.
- On-bill financing targets mostly owners of residential homes and small commercial buildings who want to upgrade existing buildings.
- On bill-financing programmes are often combined with grants to enable a wider range of measures to be cost-effective.
- Many programmes either offer a predetermined list of technology options.

# On-bill Financing Business Model

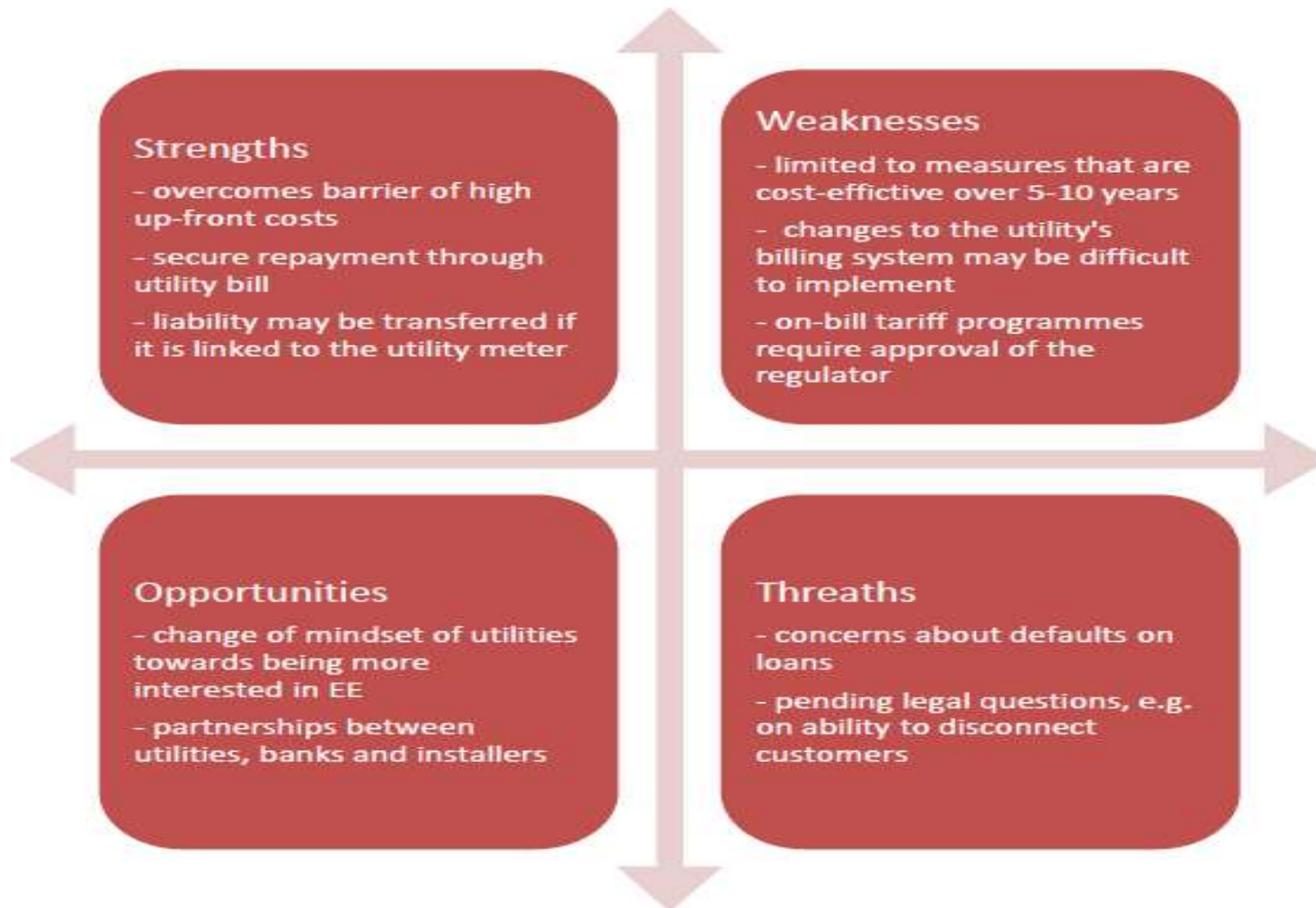
## Organisational and financial structure

- Utilities are frequently able to finance the programmes themselves as they have sufficient equity capital and access to debt facilities.
- The utility may also rely on additional partners for financing, such as banks or government bodies, e.g. through revolving funds.
- Installers of RE equipment may be involved by partnering with the utility. Successful programmes are often characterised by strong partnerships between involved actors.



# On-bill Financing Business Model

## SWAT Analysis





Thanks