



# Regulator's Role in the Promotion of Renewable Energy Resources

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Part I: Renewable Energy Policy Development

Part II: Public Private Partnerships for Renewable Energy

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# Part I: Renewable Energy Policy Development

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# Overview Part I: Renewable Energy Policy Development

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Why should RETs be promoted?

What can be done to promote RETs?

What is the role of the regulator?

## Why Renewable Power Programs?

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- Electricity is critical to all economies at any stage of development
- Choices particularly essential for developing countries:
  - Structure: Centralization vs. Decentralization
  - Dependence: Conventional vs. Renewable fuels
  - Economy: Private vs. state-owned power supply or delivery
  - Distribution of Resources: Role of Self-generation
- Electricity trades and systems operate as a function of contracts and regulation → We consciously create the system
- It is essential that we do it right
  - Long lives of hard infrastructure investments
  - Society builds *around* infrastructure choices



# Promoting Renewable Energy You Need the Right Policy

- Access to energy
  - A prerequisite for sustainable development
- Renewable energy is a viable option
  - For on/off-grid electrification, industrial applications
  - For enhancing energy and climate security
- Linking renewable energy with productive uses
  - Can create employment opportunities, raise income levels and improve quality of life



***To address barriers to renewable energy development, the right policies are needed for sending the right signals to investors and markets for wide scale adoption of Renewable Energy Technologies (RET)***

## Renewable Energy Policy Framework

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There are a number of barriers to renewable energy developments such as:

- RETs are often associated with higher upfront costs
- Social and environmental benefits of RET not always taken into account
- Although RET prices will decrease through upscaling & technological evolution, there is a need to create a level playing field
- Thus a need for appropriate policies and regulatory enabling framework





# Overview Part I: Renewable Energy Policy Development

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## How to Begin the Process – Regulatory Needs

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Changes in regulatory documents may be needed

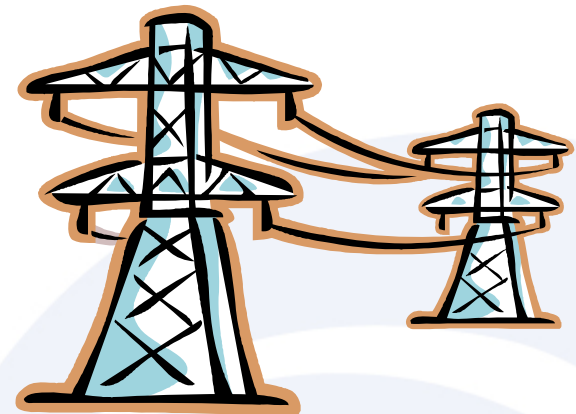
- Electricity Act
- Dispatch regulation
- Grid code
- Tariff regulation
- Light handed regulation for rural electrification



## Linking the RETs to the Rest of the System

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- Adding renewable energy is important - but it needs to fit into the existing system on the electricity market to provide optimum benefits
- Entry can be eased through formulating the appropriate rules and regulations with regard to issues such as
  - Dispatch
  - Pricing
  - Links to the rest of the system
- But of course, the system can and should be adjusted when appropriate:
  - Hardware like transmission capacity can be expanded
  - Rules, regulations, codes etc. may need to be modified and added to



## Renewable Energy Policy Support Instruments/Mechanisms

- The policy instruments that are in place in countries are all based on *two* main principles.
  - The instruments either affect the *supply* or
  - The *demand* of renewable electricity

### Categorisation of policy instruments

Policy	Feed in tariff	Fiscal Measures	Investment Subsidies	Bidding	Quota/Green certificates
Generation based (kWh)	x	x	x	x	x
Capacity based (kW)		x	x		x
Demand side		x			x
Supply side	x	x	x	x	

# Feed-in Tariffs Give Investors Increased Certainty

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## Feed-in tariffs

- Feed-in tariffs can describe both
  - The total amount per kWh, including production subsidies and/or tax refunds, received by a power producer or
  - The premium price paid above or additional to the market price of electricity
- Regulatory measures usually impose an obligation on electricity utilities to pay the power producer a price specified by the government
- Method of fixing tariffs
  - The regulator fixes the tariffs for a one-year period based on the value of the average revenue per kWh sold by the utility
- The example of Germany

# Investment Subsidies Good for Remote Rural Electrification

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## Investment subsidies

- Used for stimulating investments mainly in innovative technologies
- Investment subsidies encourages the use of RETs for remote rural electrification
- The main objective is to increase the saving of energy from fossil fuels
- Investment subsidies are usually 20-50% of eligible investment costs
- An upfront commitment reduces uncertainty
- Sweden, among others, has used investment subsidies for renewables



# Green Certificates Create Demand for Renewables

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## Green Certificates or Renewable Portfolio Standards (RPS)

- A minimum production or consumption of electricity from renewable energy sources
- Official framework within which the market has to produce, sell, or distribute a certain amount of energy from renewable sources
- The quota usually tradable between companies through tradable **green certificates**
- Accounting system used for registering production, authenticating source, and verifying if demands have been met
- Method of fixing the price
  - Market based price of certificates
  - Minimum price may be applied.
  - Penalty price for non-compliance
- Market based subsidy contains some uncertainty, can be offset by market based electricity price

## The Swedish Green Certificates – A Market Based Solution

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- System introduced in 2003, quotas set until 2030
- Objective: Increase renewable energy by 17 TWh by 2016 (2002)
- Market based signals - most cost effective technology will be built first
- Certificates issued to producers of electricity from renewable sources
- Approved technologies:
  - Bio energy, wind power, small scale hydro power, solar, wave and geothermal energy, biofuels and peat (CHP plants)
- No prioritizing between approved technologies
- Electricity suppliers/certain electricity users have to purchase certificates in accordance to set quotas of electricity sales/use
- The market based signals require markets for electricity and certificates
- Initial period extended to 2030 increasing predictability for investors
- No signals as to where to build
- Ultimately costs are carried by the consumers of electricity
- Other aspects may influence final outcome





# Bidding Systems Select Efficient Operators

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## Bidding system

- Bidding process used to select recipients of investment or production support, or for other limited rights
- Potential investors/producers compete through competitive bidding
- Opportunity to select most efficient operators
- Electricity providers are obliged to purchase a certain amount of electricity from renewable sources at a premium price
- The difference between the premium and market price is reimbursed, and is financed through a levy on all domestic electricity consumption
- Reduces the amount of “windfall profits”, but requires reasonable amount of competitive bids
- The example of Denmark



# Fiscal Measures Make Renewable Energy More Competitive

## Fiscal measures

- The basic objective is energy conservation and stimulation of the production and consumption of renewable electricity
- These schemes may take different forms such as:
  - Rebates on general energy taxes
  - Rebates for special emission taxes
  - Lower VAT rates
  - Tax exemption for green funds
  - Attractive depreciation schemes
  - CO2 taxes, the example of Sweden



# Overview Part I: Renewable Energy Policy Development

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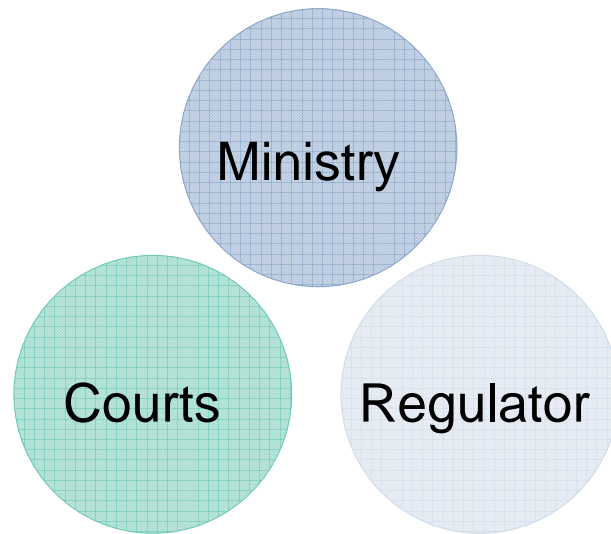
What can be done to promote RETs?

What is the role of the regulator?

# The Role of the Regulator

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## Institutional set-up



- Independent regulator?
- Who makes which decisions?

## Set-up of the regulator

- Professional or political regulators?
- Competence
  - Multi regulator or sector regulator
  - Multiple competencies required
  - Economic regulation maybe the largest challenge

# The Roles of Regulators for Renewable Energy Promotion – Facilitating the Licensing of Renewable Energy Sources

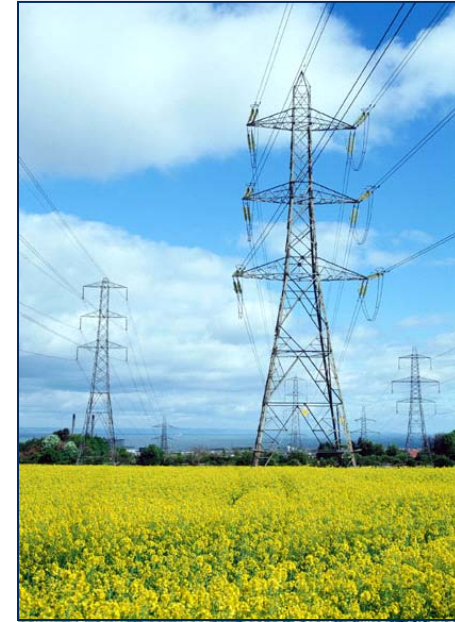
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- The regulator should develop and approve rules and procedures for granting, modifying and revoking the licenses for renewable energy generation projects
  - Develop small scale licensing framework for small capacity RET projects
  - Develop licensing framework for Renewable Energy Distributed Generation schemes
  - Set criteria for license exemption both for generation and distribution for RET projects
- Overall, the regulator should ensure that the procedures of licensing are based on equal and non-discriminatory procedures

# Roles of Regulators for Renewable Energy Promotion – Access and Transmission Pricing

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- **Grant open access to the electricity network**
  - Create/modify regulations with regard to granting access to the new RET sources in the transmission and distribution system
  - Approve grid codes
    - Benchmarks for generation capacities for connection to transmission and distribution networks to maintain grid synchronisation
    - Formulate point of connection, connection scheme, level of voltage and access to the network
- **Develop effective transmission pricing schemes which could reduce the cost of transmitting renewable based electricity**
  - Purchasing non-firm transmission capacity
  - Buying firm transmission capacity matching generation patterns
  - Regulations for selling unutilized transmission capacity in the open market



# Roles of Regulators for Renewable Energy Promotion – Tariffs and PPAs

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- Introduction of incentivised tariff scheme
  - Feed-in tariffs
    - Allowing small producers of renewable energy a certain return on investment without the volatility of wholesale and retail market pricing.
  - Net metering regulations
    - Facilitating the interconnection of small renewable energy generators to the grid - the producers are ultimately charged/paid for their net production/use
- Define and outline of Power Purchase Agreements from renewable energy sources
  - Drafting an outline PPA under the feed-in tariff scheme, focusing on the specific terms associated with the feed-in tariff
  - A drafter's guide to the model PPA - information for potential investors

# Roles of Regulators for Renewable Energy Promotion – Developing Project Qualification Criteria

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Establish a set of transparent criteria for renewable energy projects to qualify for the guaranteed feed-in tariffs

These criteria would be in terms of

- Energy sources
- Technologies
- System capacity size
- Expected system output
- Expected system reliability and performance
- Quality of resources
- Technical and financial viability
- Commercial maturity
- Job creation and local manufacturing potential
- Etc.





## Part II: Public Private Partnerships for Renewable Energy

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# Overview Part II: PPP for Renewable Energy

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## The concept of PPP

Common PPP models used for RETs

Case studies

Key lessons learnt

# The PPP Concept

- PPP involves the public and private sectors working in co-operation and partnership to provide infrastructure and services
- The principle :
  - Using publicly owned assets more efficiently
  - Combining private sector financing and implementation with the government paying for services over a period of time
- The essence is the government moving from *providing* services to *purchasing* services!

## GOALS

- ✓ Use Government Resources to attract private investments
- ✓ Improve efficiency in service delivery

## PPP APPROACH

Private Sector  
Contribution for:

- ✓ Financial Investments
- ✓ Improved technologies
- ✓ Efficiency in service delivery

Public Sector  
Contribution for:

- ✓ Financial gap funding to make projects commercially viable
- ✓ Providing institutional support guidance & regulation

# Overview Part II: PPP for Renewable Energy

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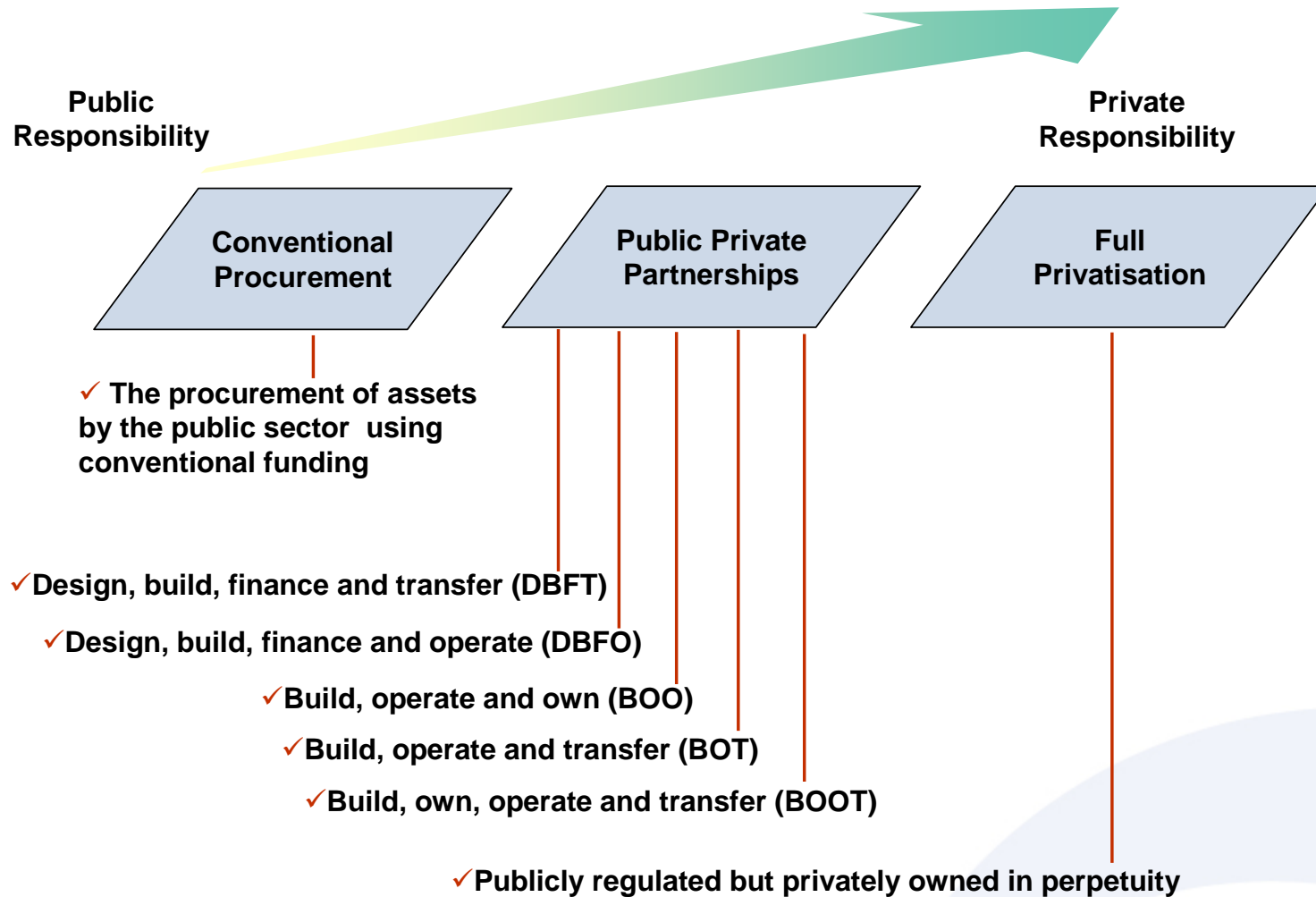
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# PPP Structures for Renewable Energy

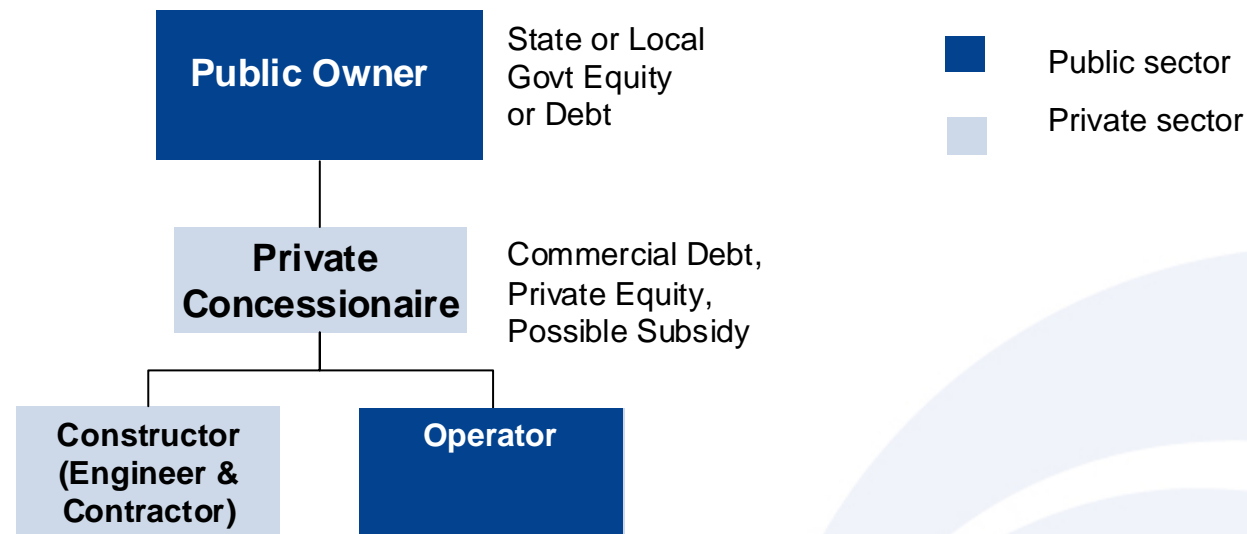


Source: Based on material from KPMG

# Build, Operate, Transfer (BOT)

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- An integrated partnership combining the design and construction responsibilities of design-build procurement with operations and maintenance
- Design, construction, and operation of a single facility or group of assets is transferred to a private sector partner
- Several governments around the world use this approach, but known by different names including "turnkey" procurement



- BOT is a type of project financing
- The hallmarks of project financing are:
  - The lenders look primarily at the earnings of the project as the source from which loan repayments will be made.
  - The security taken by the lenders is largely confined to the project assets
- Most project finance structures are complex
- The risks in the project are spread between the various parties

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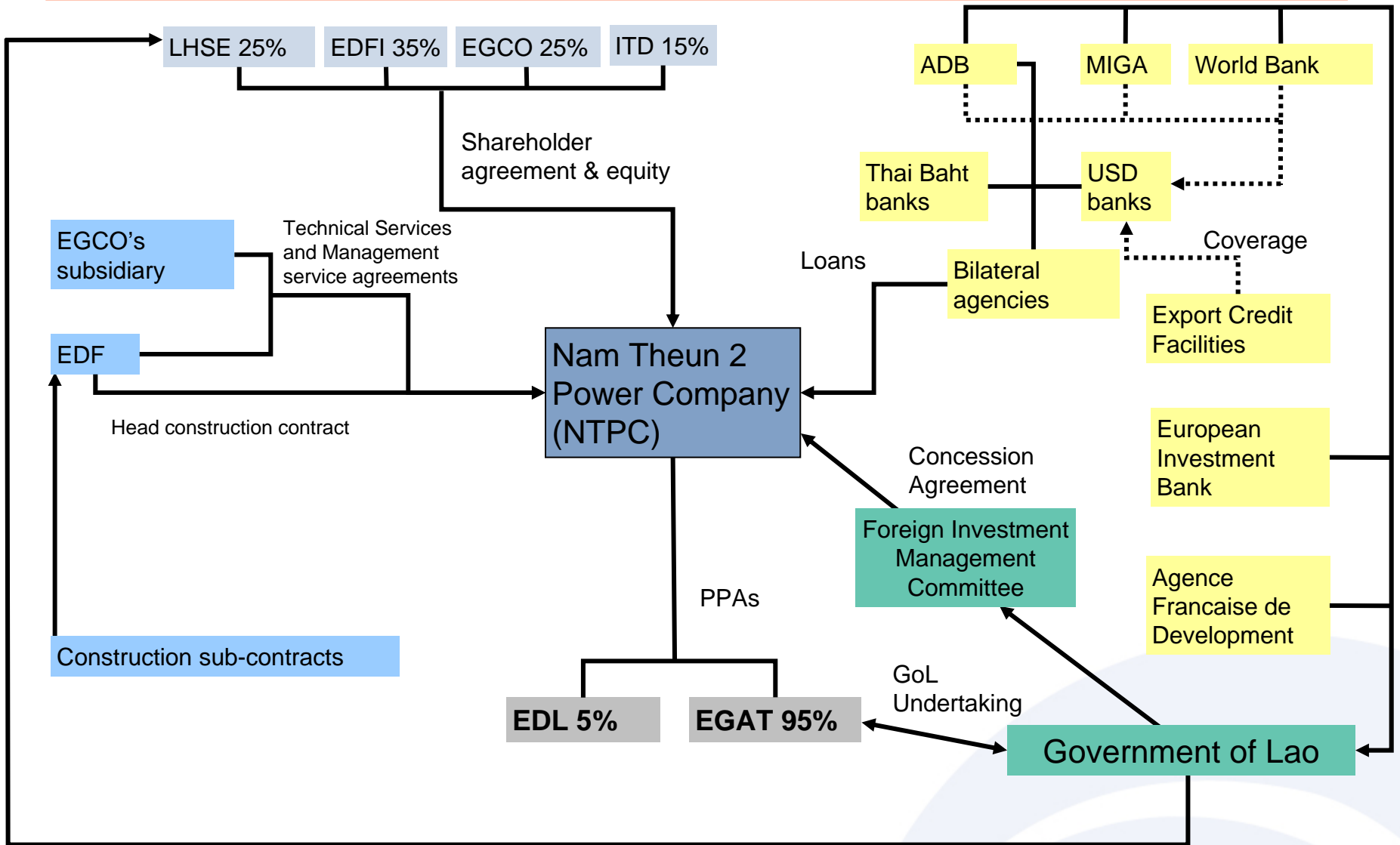
# Case Study: PPP in Hydro Power Development (Nam Theun 2 – A Dam within the Mekong River Basin) 1(9)

- Capacity of the plant is 1075 MW
- The project consist of a 48 meter high gravity dam, a 450 sq km reservoir, a power house
- 130 km 500 kV transmission line to deliver electricity to the Thai grid and a 70 km 115 kV transmission line to deliver electricity for domestic usage. These will interconnect the Power Station with the EGAT and EdL power transmission systems
- Ancillary works: roads, bridges etc
- The project spread over an area of 10 000sq km and includes 14 construction sites and 300km of linear construction zones
- Planned commission date is December 2009



# Project Structure

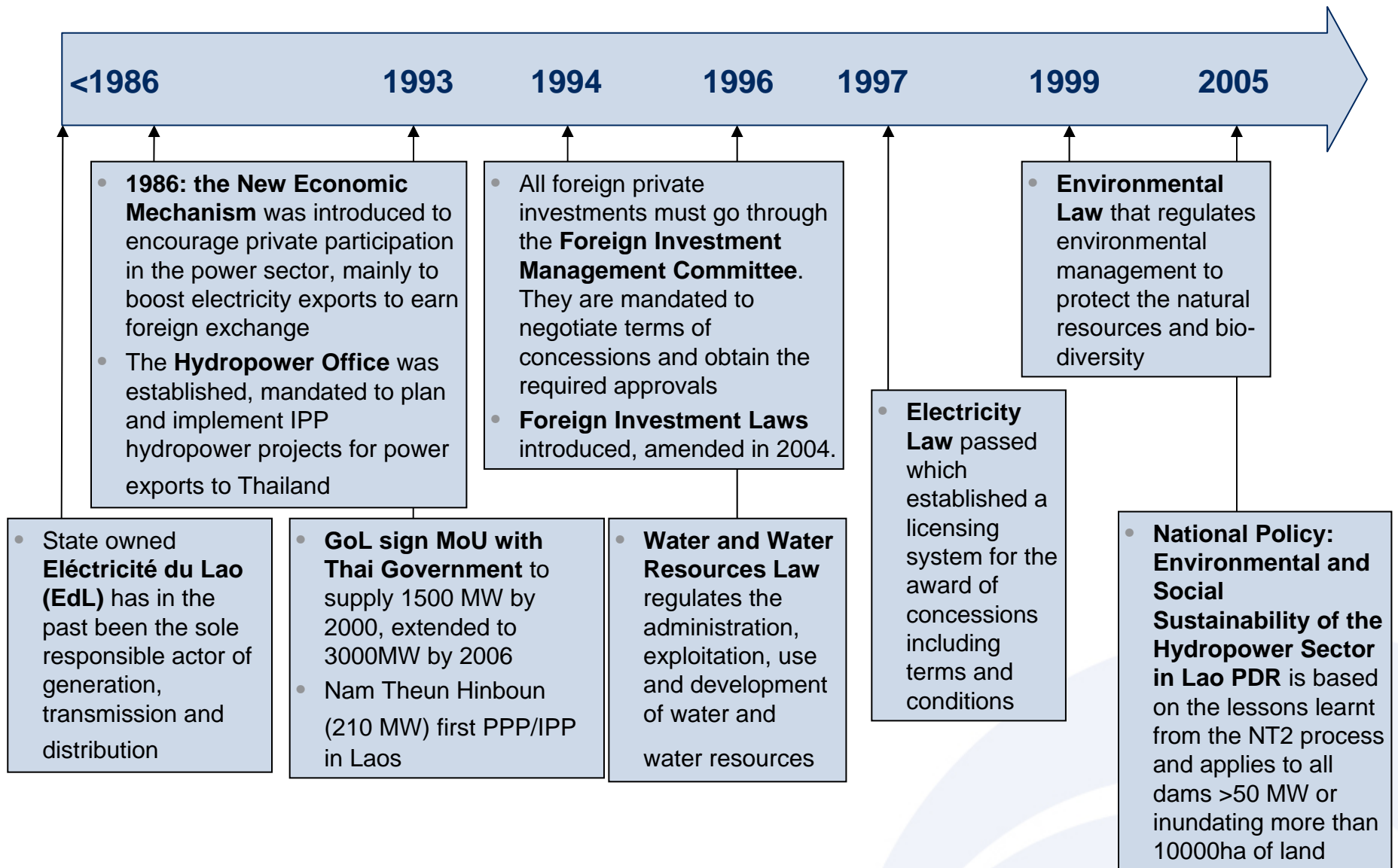
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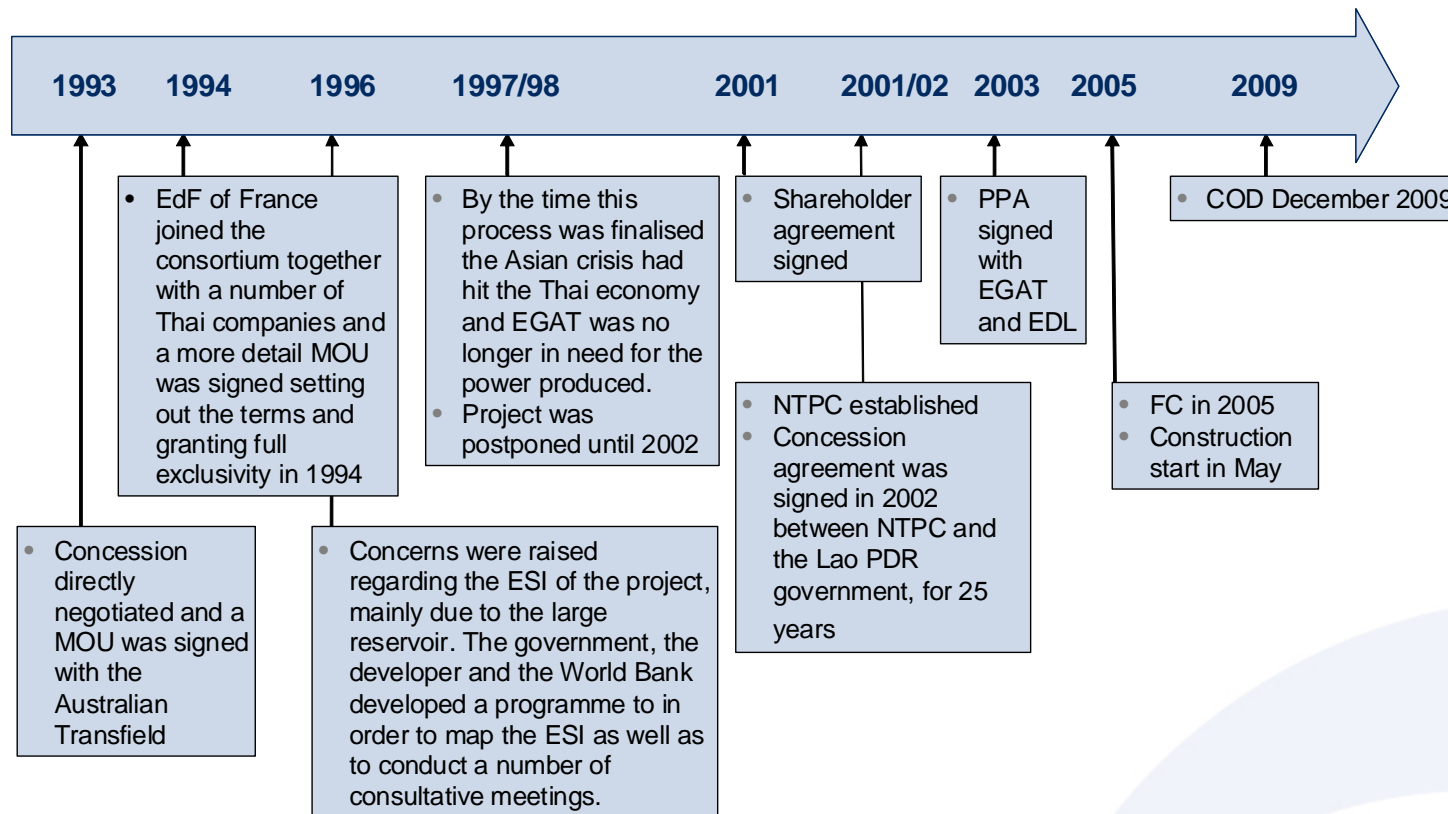
- Lao PDR has no specific BOT legislation and no formalized procedures for the award of BOT concessions. Hydro concession has been negotiated on a case by case basis with the government.
- Foreign Investment Law (1994) regulates the following:
  - The investments cannot be requisitioned, confiscated or nationalized except for a public purpose and with proper compensation
  - The investment can take the form of either a joint venture with local partners or wholly foreign partners
  - Foreign investors may lease land and transfer lease held interests
  - Employing Lao citizens prioritized, but other nationals may be employed if the skills are required
  - Earnings can be repatriated through Lao or foreign banks in Lao PDR
  - Arbitration should follow international procedures

# Development of Regulatory Environment in Lao PDR and Other Milestones, Relevant for NT2

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- Multilateral agencies such as WB and IFC supported the GoL with the concession process

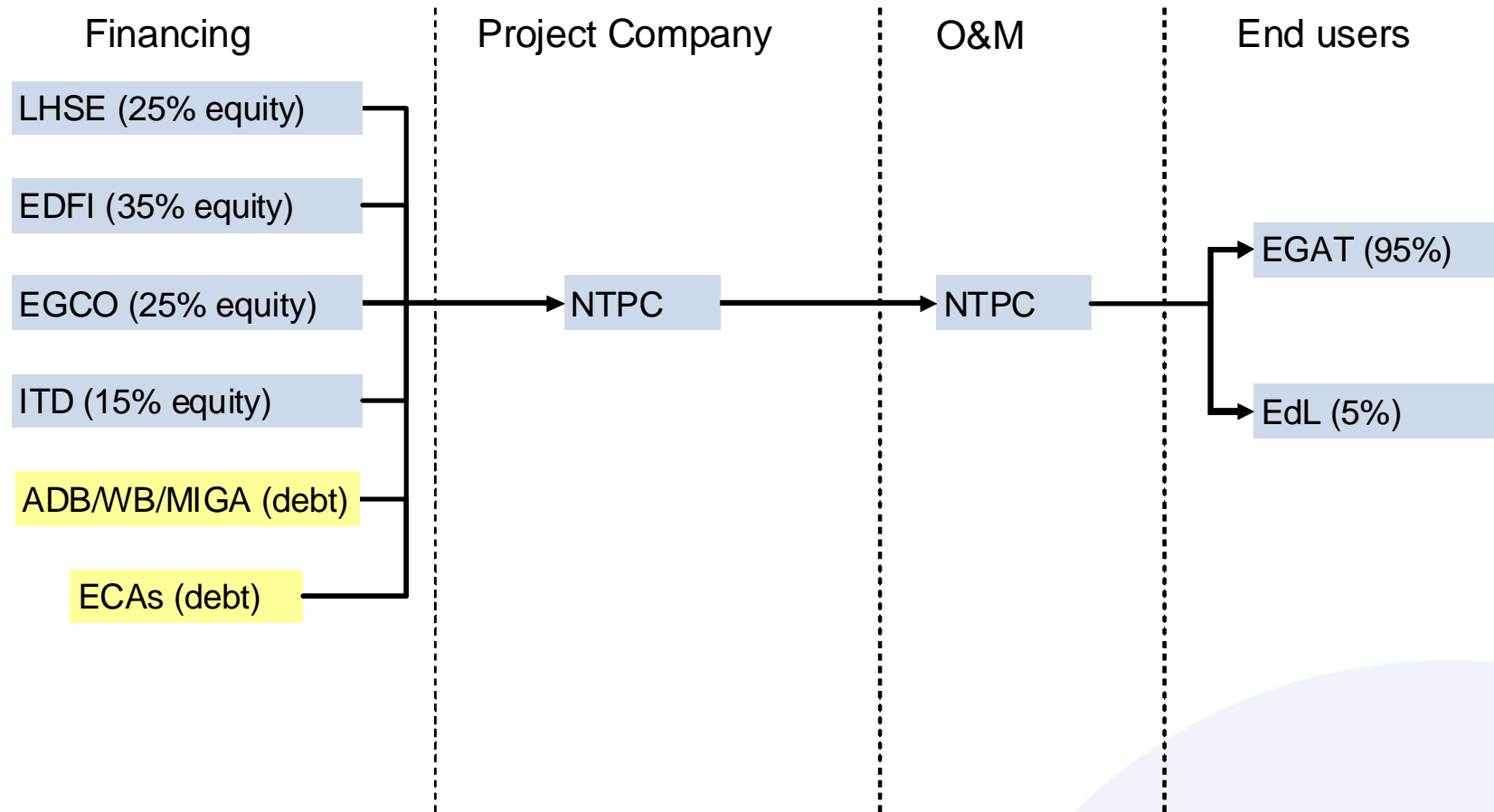


- **The Concession agreement divides the Project into four phases**
  1. Condition Precedent Phase
  2. Preliminary Construction Work Phase
  3. Construction Work Phase
  4. Operating Phase – Company is *”obligated to operate and maintain the Project in accordance with certain standards”*
- **Land & Water rights**
  - GoL will give the company *”right of access to, use and possession of Project Land sufficient to enable the Company to exercise its rights and performs its obligations”*
  - GoL will grant *”free of charge to the Company exclusive Water Rights”*
- **The PPAs**
  - The agreement allows the company to sell power to EGAT and to EdL, governed by each respective PPA
  - The company is prohibited to enter into agreements with any third party
- **Transmission System**
  - The ownership and responsibility will remain with the Company during the full concession period
- **Termination/Transfer**
  - The agreement regulates factors leading to an early termination
  - By the time the concession period is over, the company is required, free of compensation from the GoL, to transfer the Project and Project Assets
- **Other issues**
  - The Agreement regulates Actions to be taken in relation to environmental and social issues
  - The Company is exempted from several taxes, as are contractors
  - Company must pay profit tax and resource usage charges

Sources: NTPC, Summary of Concession Agreement

# Summing Up – Financing and Structure

7(9)



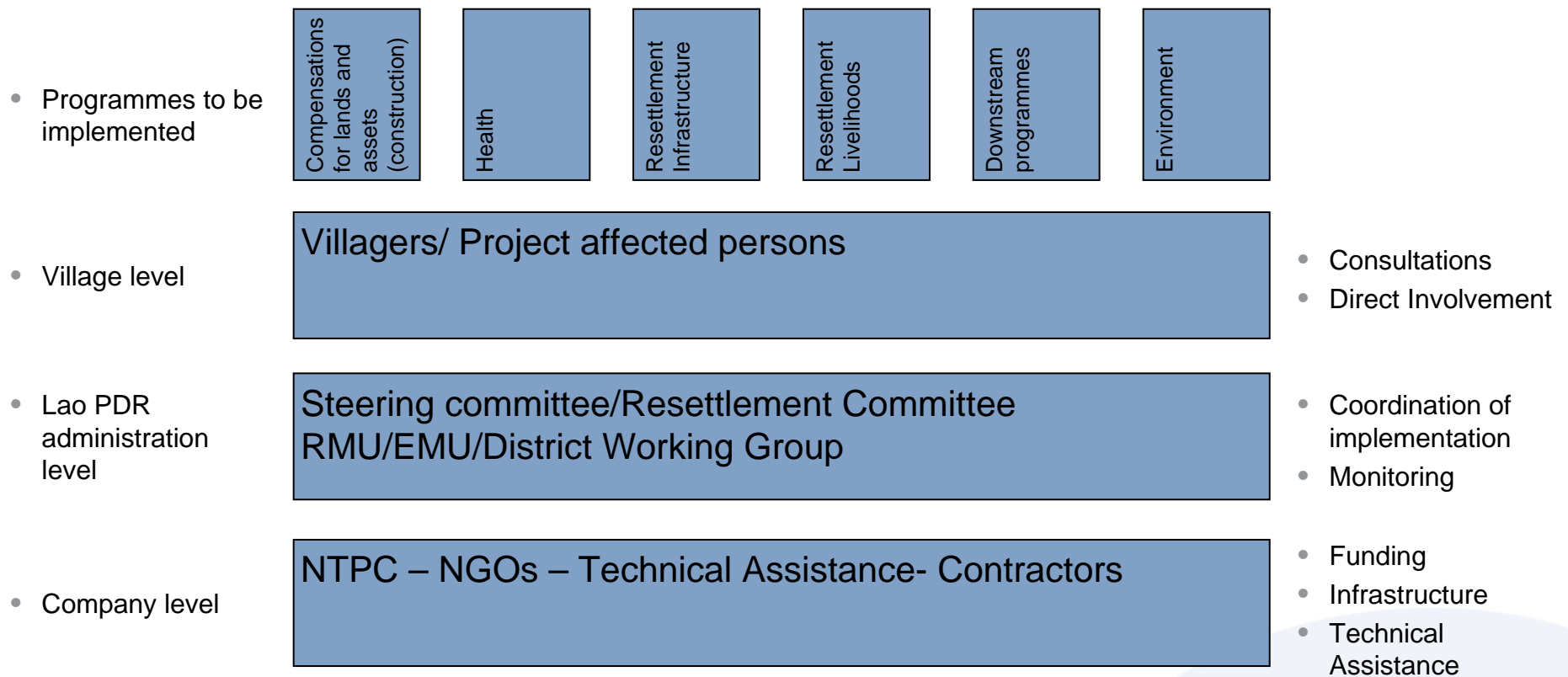
- The project has a **16 million USD Development Programme** covering 200 villages downstream of the plant.
- The concession agreement includes an obligation on the company to carry out a **Health Impacts Assessment (HIA)** and implement the **Environmental Management Plan (EMP)**.
- Clear **resettlement plans and plans for temporary housing** must be addressed as it forms part of the concession agreement.
- Concession Agreement outlines that during the Resettlement Period, estimated to be 9 years, a **target for the income earning capacity for the settlers is set**.
- NTPC has a **team of 150 staff** for the E&S activities while GoL has a **team of 300 technical staff**.
- During the 33 month period from FC to March 2008, the project had 59 external review/monitoring missions, an **average of nearly 2 per month**.
- However, certain aspects of social and environmental impacts were criticised



# NT2 Environmental and Social measures

9(9)

All environmental and social measures are to be implemented jointly



Sources: NTPC website

- Project Description
  - Client: Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (BMZ)
  - Country: Madagascar
  - Partner: e7 Network of Expertise for the Global Environment (Électricité de France, RWE, Hydro Québec), Electricité de Madagascar (EDM)
  - Overall term: 2005 to 2009
  - Capacity : 4 MW
- The Lokoho project is a public-private partnership (PPP) between GTZ and the private partners e7 and EDM
- The project: Integrating electricity generated by a newly constructed small-scale hydro power plant into a comprehensive approach of rural development

- Objective

- Energy from the Lokoho small-scale hydro power plant to promote rural development in NE Madagascar
- Growing rural incomes leading to an increase in energy demand and ultimately to an increase in profitability for the private utilities

- Approach

- e7 is responsible both for the construction of a small-scale hydro power plant on the Lokoho river in NE Madagascar, and for the construction of the transmission lines
- The e7 member Electricité de France engages in a business relationship with the private Malagasy utility Electricité de Madagascar. Both enterprises set up one company for the operation of the power plant and another company for the distribution of energy in the rural areas.

- Approach (continued)
  - The generated electricity partly sold to the national utility for distribution in two urban centres
  - Remaining electricity used for the electrification of 30 villages in the areas surrounding the two towns and the power plant.
  - The Lokoho project was developed in close cooperation with the Growing Sustainable Business initiative, which is coordinated by the UNDP
  -
- Results
  - The electrification of rural areas in NE Madagascar in combination with the promotion of productive use of energy contributes to the economic and social development of the project region.
  - 16 000 households in the rural areas will gain first-time access to a modern and affordable power supply

# Overview Part II: PPP for Renewable Energy

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## Key Lessons Learnt – Important Areas for PPP Projects 1(2)

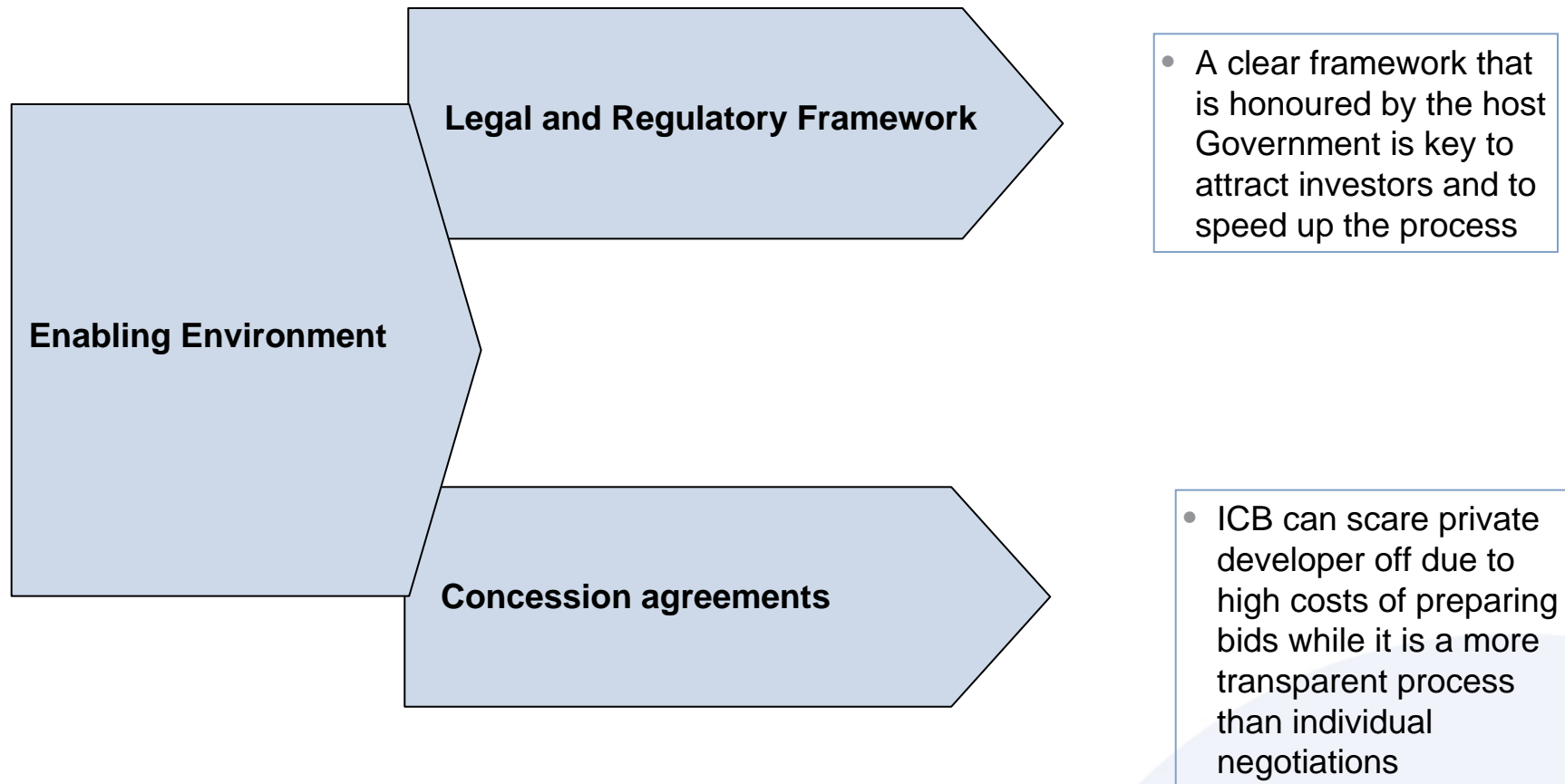
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- Enabling environment
  - Legal and Regulatory Framework
  - Concession agreements
  
- Energy sales contracts
  - Firm energy sales contracts (PPA)
  
- Mobilization of Investments
  - Debt
  - Equity
  - Guarantees to mobilize funds
  
- Adequate Project Implementation Arrangements

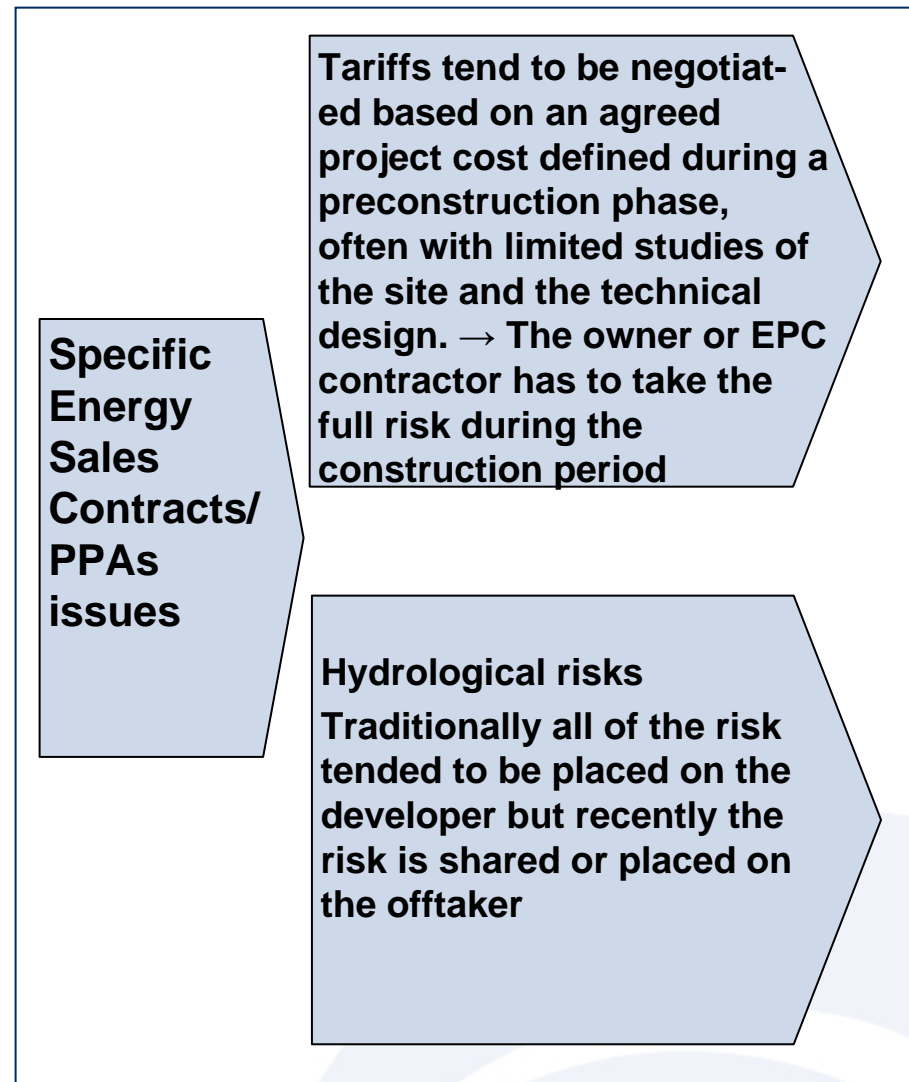
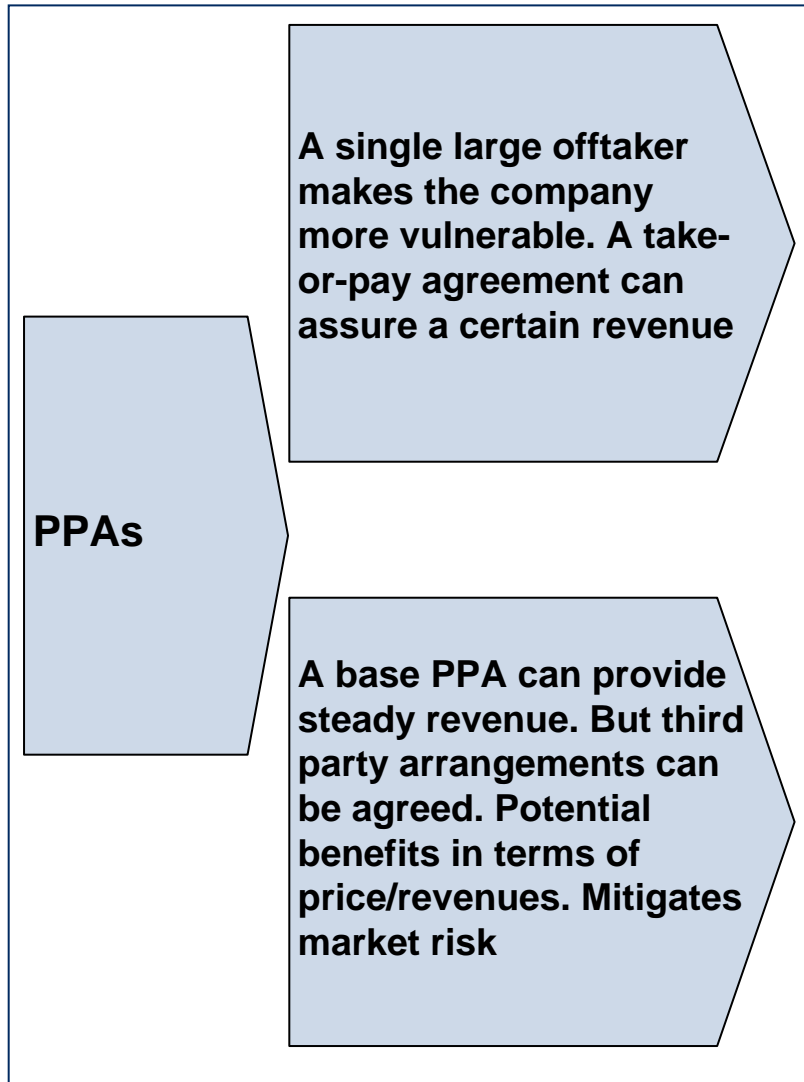
## Key Lessons Learnt – Important Areas for PPP Projects 2(2)

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- Role of host Government
  - Site development
  - Assume responsibility for initial project design and site visits
  - Minimize bureaucracy, increase transparency and accountability, honour power sector regulatory framework
  - Assist in obtaining environmental permits and site acquisition
  
- Minimize and mitigate Environmental and Social Impacts
  
- Devise adequate risk sharing mechanisms by selecting the best suited concession agreement
  - Financial risk
  - Market risk
  - Political risk
  - Construction risk etc.







# Highlight - Mobilization of investment

3(7)

## Equity

Host government/utility

Special purpose project companies

## Debt

Export Credit Agencies (ECAs)

Multilateral Development Banks (MDBs)

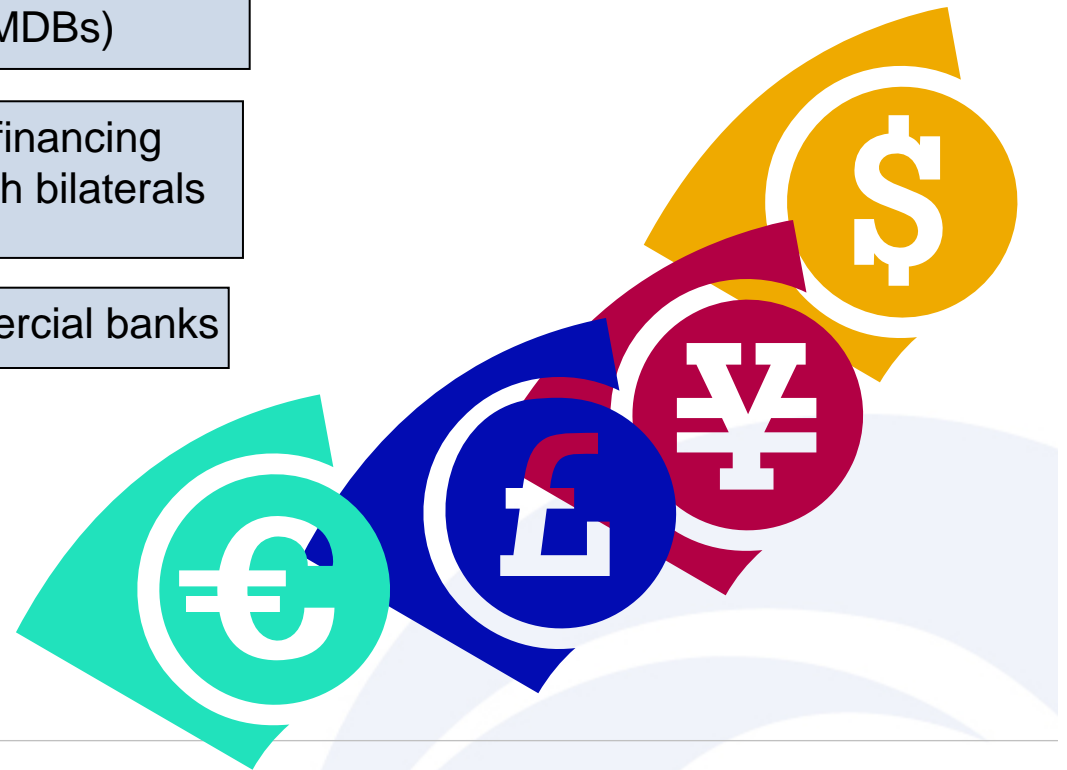
Co-financing through bilaterals

Commercial banks

## Guarantees

MIGA

Host government

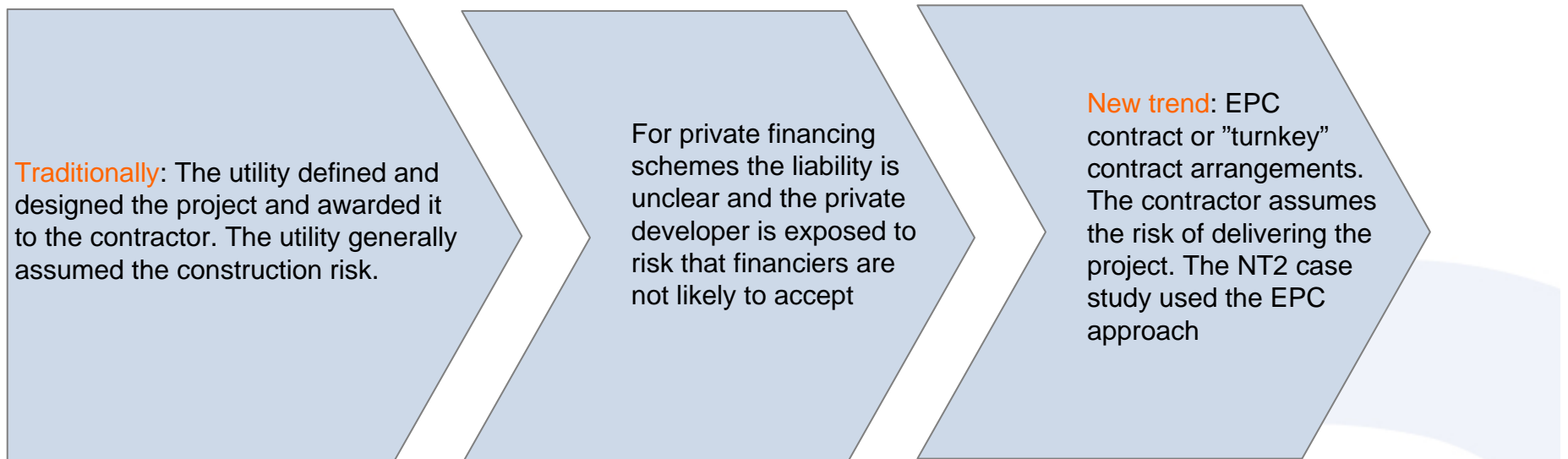


## General approach to project implementation arrangements

Issues that are specific to the RET in question should be considered

Example: For hydro power projects e.g. the following issues need careful attention:

1. Front-end studies to establish the project design and feasibility are expensive and time consuming
2. Difficult to determine costs and completion dates in advance
3. Necessary to carefully mitigate construction risks to avoid inflating contract price



## Development

Stage	Description
Scoping	Initial identification of sites, based on available information
Pre-feasibility	Brief outline of scheme concept
Short feasibility	Initial optimization of main project parameters, using existing data and limited field data collection. Limited Environmental and Social Impact Assessments (ESIA)
Full feasibility	Detailed mapping of the site and detailed geological investigations resulting in final optimal concept with well defined project parameters. Cost estimates finalized based on reliable and reasonable quantities. Full ESIA.
Design (Tender Design)	Structure-specific site investigation and development of design and individual structure specifications. This will be the basis for engineer's estimations and is traditionally used for tendering.
Detailed design	Detailed design of each component. This should be carried out in parallel with construction and should be modified to meet any changing conditions.

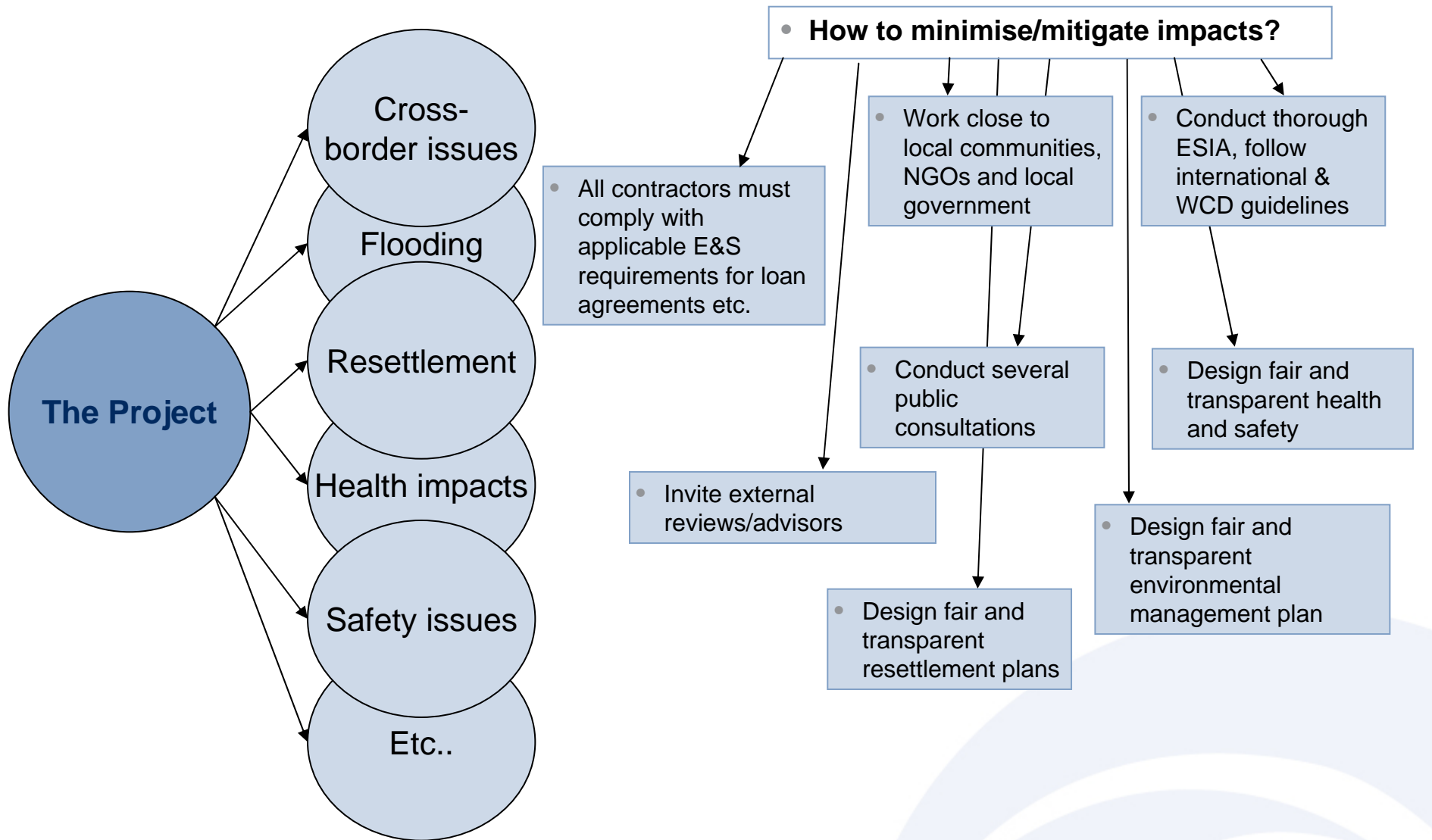
## Awarding of contracts

	Pros	Cons
Early award	Lower front-end costs for the developer. Reduced liability related to information sharing of project details.	Difficulty to estimate final costs and hence difficulty to match costs with the PPA agreement
Late award	Easier determination of final costs and likely better match with the PPA agreement	Increased liability High front-end costs

## Highlights - Role of Host Government and Utility

6(7)

Host government	Utility
Site development in relation to river basin management plans if applicable	
Minimized bureaucracy, increased transparency and accountability, honour power sector regulatory framework	As offtaker and honouring the PPA
Cost-benefit balance, considering local communities specifically	
Ensure safety, health, environmental and resettlement standards and manage environmental mitigation plans	Resettlement, compensation, land and water rights issues
Assume responsibility for initial project design and site visits	Initial preparation studies
Share project risks	Share project risk
Assist in obtaining environmental permits and site acquisition	Environmental clearances
	Mobilize support from Multilaterals
Coordinate actions initiated by NGOs so that they contribute to the success of the project and not unfairly damage corporate images	



## Summing Up the Key Lessons in PPP

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Key Issue	Conclusion/Recommendation
Enabling Environment & Regulatory background	Strong and transparent legal and regulatory framework favourable for private investment while also assuring that the benefits are transferred back to the host country
Concession arrangement	Highly dependent on regulatory framework
Energy Sales Contracts/PPAs	Highly dependent on regulatory framework
Mobilization of investments	Preferably in both local and foreign currency to mitigate currency risks
Project Implementation Arrangements	EPC contracts
Role of Host Government & Utility	Active roles, supporting
Environmental and Social Impacts	Establish a support unit at NBI that can assist NBI countries to assure that environmental and social impacts are minimized
Risk sharing	Case by case dependent but to be guided by international best practise
Time line/planning	From the start of the project, draw out a time line, detailing when and what needs to be done, roles and responsibilities
Expectations	Clear and transparent plans outlining the purpose of the project, from a developer, governmental and civil society point of view

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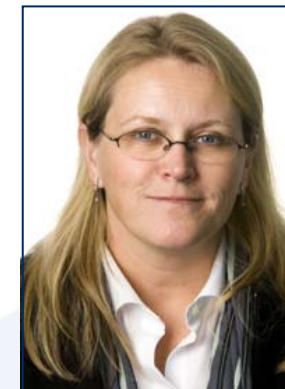
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