Online training of SAARC Professionals on Small, Mini and Micro Hydro Power Generation (Sept 13 - 17, 2021)

Financing Mechanism and Business Model of SMMHP Plants

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Contents

- Various financing options
- Terms and conditions for financing
- Different business models and their features for SHP
- Power purchase agreement – important part of business model

Learning Objectives

Prevailing financing options and business models for SHP projects in the region.

Financing Basic – Who is Owner?

- Government
- Private
- Joint Venture
- Charity

Financing Basic

- Subsidy
- Equity
- Credit / loan
- Sub inversion of interest
- Generation based incentive

Charity – normally O&M cost is charged and capital is supported

Commercial – return on investment and profit

General Eligibility Conditions

Eligible Entities/ Categories

- Private Sector Companies/ firms/LLPs
- Central Public Sector Undertaking (CPSU)
- State Utilities/ DISCOMS/ TRANSCOS/ GENCOS/ Corporations
- Joint Sector Companies

Non-Eligible Categories

- Accounts classified as NPA with other Institutions/ at the time of applying.
- Applicants/ Group Companies and/or Core promoters of the applicant company who –

General Eligibility Conditions

- Default in payment of IREDA dues and/ or,
- Classified as willful defaulters as defined by RBI/ classified by other FIs and/ or,
- Had availed One Time Settlement (OTS) from that bank,
- Convicted by court for criminal/ economic offences or under national security laws

Preliminary Check of mandatory documents

- The following are the mandatory Documents/ information;
  - TEC of DPR from state nodal agency,
  - Implementation agreement/ memorandum of agreement to take up execution of project.
  - Land acquisition status.
  - Power Selling arrangement
  - Power evacuation arrangement
  - Source of equity

Technical evaluation of the project

On receipt of the information, the technical evaluation is taken up which includes the following

- **Energy Calculation**: There is huge risk involved in projected energy calculations carried out by the developer in the DPR, this needs to be revalidated internally/ through external agency.
    - third party assessment on hydrology, geology and power evacuation from Consultant of repute.
- The technical vetting of The low head ROR schemes is being carried out thoroughly and securities TO BE STRENGTHENED.
- There are much geological risk involved.
- Accessibility of Site – A site visit is being carried out to check the same.

Financial Evaluation

- **Project Cost:** In the most of cases the project cost is approved as a part of TEC, some times the borrower shows escalation over and above the same which needs to be checked thoroughly.
- **PPA:** the open market rate of power is vary low, the long term firm PPA is mandatory for carrying out the financial evaluation.
- **Tariff:** The tariff is governed by the State Tariff Regulations issued by the State electricity regulatory commisssi0n (SERC), There are two type of tariff is available in SHP Sector.
  - The generic levelized tariff,
  - Project specific tariff.

Financial Evaluation

- Based on the **Energy, PPA, Project Cost, construction period**, financial evaluation is carried out along with the sensitivity analysis.

• IRR	>	14% or > Applicable Interest Rate
• DSCR (avg.)	>	1.2 (for new project it should be about 1.4 as there is risk of time and cost overrun)
• BEP	<	Designed energy (assumed)
• NPV	>	0
• Cost of generation	<	Selling price
• Asset coverage ratio	>	1.2

SHP: Broad Lending Norms of One of the FI in India

Parameter	Norms
Quantum of Assistance	Up to 70% of the Project cost.
Rate of Interest	10.25% - 11.45% per annum Actual Interest rates are subject to Credit ratings.
Moratorium on Principal repayment	Up to 1 year after Commissioning.
Repayment after moratorium	Up to 20 years

- Exposer in small hydro is reduced to 50% of the project cost and balance loan to be arranged by borrower from other Bank/FI under co-financing or consortium financing arrangement.
- In case of Consortium, FI can align the terms and conditions of the Lead Lenders.

Risks and Challenges

- **Before Construction**
  - Availability of reliable hydrological data and geological data.
  - Delay in land acquisition (Forest department clearance)
  - Multiple clearances from different government agencies (pollution, fishery, forest and water resources etc.) - Policy issues
  - Regulatory issues : Grid connectivity, Long term PPA and Tariff
  - Local people resistance
  - Higher upfront capital requirement than other RE sources of generation.
  - Smaller projects in remote locations do not lead to economies of scale

Risks and Challenges

- **During Implementation**
  - Power evacuation Infrastructure by State Govt.
  - Availability of access Infrastructure for sites located in remote areas
  - Geological surprises and natural calamities
  - Equity Risk/ Dispute among promoters
  - The time taken to commission a SHP is more than other RE technologies

Risks and Challenges

- **During operation**:
  - Hydrological risk: Generation not as envisaged during the appraisal due to drought years, low discharge availability as compared to envisaged discharge
  - Silt in Himalayan region: Project unable to operate during the monsoon due to high silt load in water since it causes damage in the under water part of turbine.
  - Natural Calamities Like Flood/ cloud burst / land slide: Projects may be damaged Causing loss of generation and further investment/ RETURNS

Risks and Challenges

- Default or delay in payments from electricity distribution company / power procurer.
- Reduction in revenue realization in case of open access in recent years.

- Low head projects
- Due to above mentioned strategic issues and challenges banks and other financial institutions made their financial norms stringent to provide financial assistance.

Risks Mitigation

- External and Internal rating of the Borrower Company and Sponsor Company.
- KYC documents verification.
- Evaluation of Experience of the company to deal with local issues and operation risks
- Assessment of Technical capabilities of the borrower based on the past experience.
- Technical feasibility of project by experienced institutions before the sanction of the loan.

Risks Mitigation

- Assessment of Financial capabilities of the borrower based on the past experience.
- Appointment of "Lender's Engineer" & "Concurrent Auditor" Financial Advisors for close monitoring of physical / financial progress of the projects.
- Emphasis on Firm Power Sale Agreement and power evacuation arrangement for long term
- Limiting IREDA's loan exposure up to 50% of the project cost instead of present 70% and balance loan to be arranged by borrower from other Bank/FI under co-financing/Consortium Lending
- Social & Environment Impact Assessment of the Project

FINANCING & INSURANCE

- Financing and Insurance are like blood vessels and security cover for any SHP Project.

- In today's scenario in India the debt cost should be below 9% interest on floating interest rate. The global interest rates on SHP projects are around 4%.

- Security : the Hypothecation of all the project assets and personal guarantees of the Directors should be a reasonable security. It gives 1:3 time assets security against loan with additional net worth of directors.

FINANCING & INSURANCE

- Also the first charge on Escrow account / TRA is an additional security where control of revenues remains with the banks / FIs.
- Many projects suffer due to inability of the additional collateral which should not be insisted.
- The Processing fees should be minimal and no other guarantees or deposits should be asked for green field projects. DPRs are with lot of investigations and studies approved at various levels of the Government sector.
- DSRA of two quarters to be built within three years from date of commissioning to provide additional security to the bank.

FINANCING & INSURANCE

- “Contingencies Loan” component should be built in term loan sanction which is in addition to the project cost to meet any unforeseen development during construction period including geological surprises and cost escalations.
- Special provision be kept for flood disaster or unforeseen force majeure conditions.
- Time line for processing, sanction, documentation and releases must be streamlined within a capsule of three months to give necessary support to the SHP energy sector considered as a national priority.
- If tariff by regulator is linked with date of commissioning, the PPA should not be insisted early. The State Govt. Policy & SERC regulations shall ensure must buy status of sale of power.

FINANCING & INSURANCE

- Securitization of loan on the basis of revenue discounting method be encouraged for the operating SHP units. This will help to rehabilitate many sick projects.
- Projects under NPA category due to natural disaster and not due to willful default be treated for financing with information to RBI.

INSURANCE ASPECTS / COVERAGE

- Type of insurance available including fire, flood, hurricane to the Small Hydro Power Projects.

  Industrial all risk policy. What all it covers?

- Break down policy, Loss of Profit policy based on revenues.

  Details of Mechanism.

INSURANCE ASPECTS / COVERAGE

- Project insurance should be on the reinstatement value of every component. Insurance on various segment should also be mentioned separately in addition to the total project reinstatement value.

- Some mechanism to be adopted so as surveyor and person settling the claim are in line with the commitment and assurance given at the time of Insurance cover.

INSURANCE ASPECTS / COVERAGE

- Coverage of personal accident policy for employees as well as Third-Party & Contractor Insurance.
- Medical coverage for the workers.
- Medical coverage for the workers along with their families.
- Is insurance cover for Hydrology available?

KEY COMMERCIAL AGREEMENTS

- Power Purchase Agreements (PPA)
- Bulk Supply Agreements
- Transmission Agreements
- Open Access Agreements

IMPORTANCE OF PPA

- PPA is a contract between Generator and Distribution Licensee/trader/ consumer.
- The PPA is a important contract so its sanctity is very critical.
- It shows the kind of credit worthiness of purchaser and affects investor's confidence.
- After PPA is executed negotiations ceases and obligations start flowing
- Lender to a project starts financing only after PPA is final and approved by the Regulators.

REGULATOR'S CONCERN

- Power Purchase is major component of the cost of a the project.
- Regulator's mandate is to approve tariff and terms and condition of a PPA to check unnecessary cost which ultimately otherwise goes to consumer.
- To achieve this Regulator makes guidelines for the licensee to purchase power on merit order.

What is Business Model ?

For Any Business

Investment (Cost) + Profit = Sale (Recovery)

Electricity Business has some Special Characteristics

- Citizens feels it is the duty of the Government to supply 24X7 electricity to all citizens at no cost or at least at affordable prices
- It is to be consumed as produced. Cost of storage is high.
- Countries are concerned about Energy reserves.
- It is a essential as water and air.
- It helps in improving economic and social life significantly.
- Environment concerns about use of energy sources based on carbon.

Characteristics of Various Models

Business Models	Private Sector Role	Public Sector/ State Govt. Role	Assumption of Risk	Financial Arrangement	Suitability	Customer
Privatization	Ownership, Investment, Management Operation	Selection of private party Emergency support Monitoring of services	Private	Profit/Loss with Private	Generation and distribution	Higher levels of service for the customers but may be at higher cost
Management/Service Contract	Management/ service for a identified business at fee	Ownership Investment Payment of fee	Government	Private sector gets a fee. Govt. keeps profits or bear losses	Generation/Distribution	Improved service
Fully Government Owned	NIL	Ownership, Investment, Management Operation	Govt.	Profit/Loss with Private	Transmission/ Generation/Distribution	Service as usual
Franchise / Lease	Investment, Management Operation	Ownership Monitoring Regulatory	Financial risk with private Service Risk with Govt.	Government is insulated from profit/loss of business which is taken care by Private	Distribution	Better service
PPP	Investment Management Operation	Selection of private party Emergency support Monitoring of services	Financial Risk is with private	Predetermined profit to private	Transmission/ Generation/Distribution	Better service

Business Enabling Environment

There are two main objectives:

Private Sector Investment

- Meeting demand and supply
- Power sector remains financially solvent
- Attract investment
- Quality service to end users

Increase in Electricity Access to meet National Objectives of

- Economic
- Social
- Environmental

Business Enabling Environment

- Strong Transparent Legal and Regulatory Framework
- Creditworthy Off-takers
- Cost Reflective Retail Tariff Structure
- Technical and Commercial Efficiency
- Clear and Transparent Procurement Processes
- Sound Strategic and Integrated Power Sector Planning
- Streamlined and Transparent Processes for Project Development

Business Enabling Environment

- Increased Clean Energy Share
- Strong Regional Power Pools
- Universal Electricity Access, Achieved through the Strategic Use of On-grid, Off-grid, and Small-scale Solutions
- Adherence to Internationally Recognized Environmental and Social Standards and Best Practices
- Gender Equality and Female Empowerment

Possible Models

- Grid Supply with Distribution Strengthening
- Distributed Generation with Grid Back up
- Independent Micro Grids with Local Generation
- Individual systems

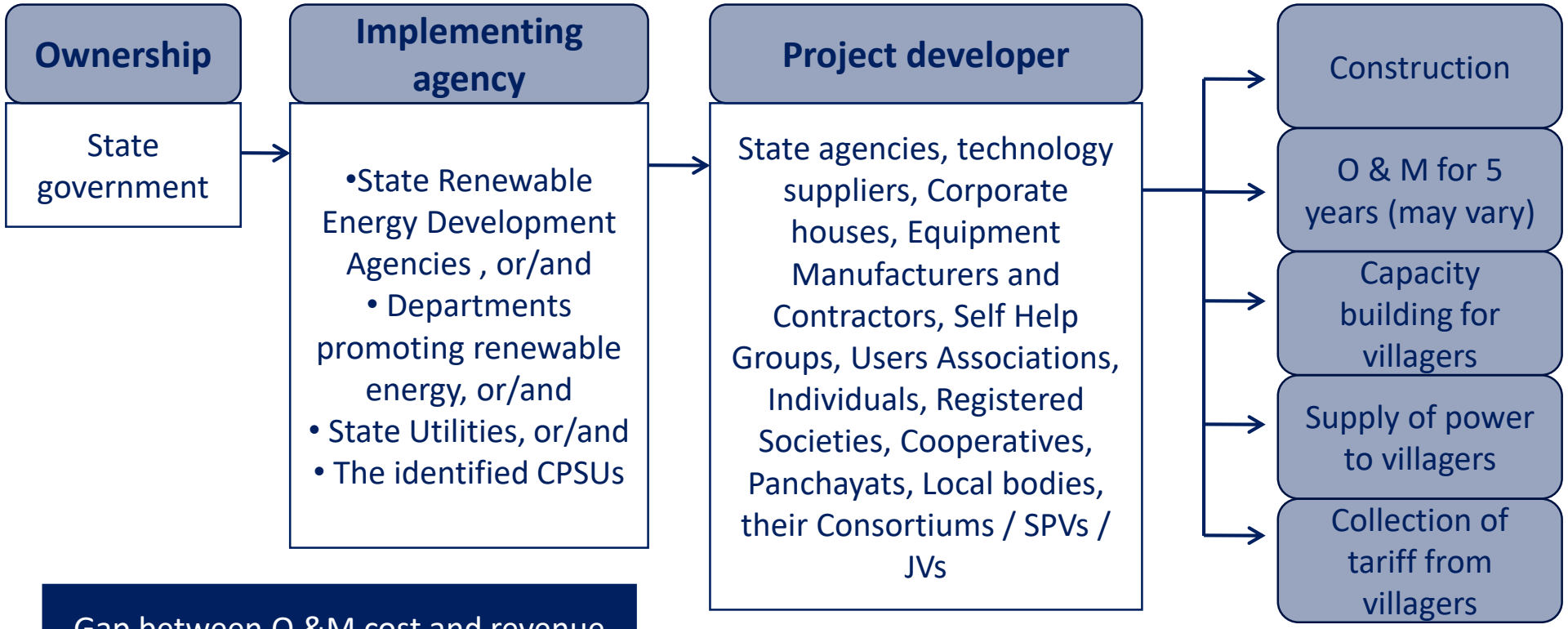
Grid connectivity: Options

- Availability of grid
  - For evacuating energy from the generation site, requisite facilities for grid interfacing to be provided by State utility(some time with the cost)
- Non-availability of grid
  - For areas where grid connectivity is not possible at present, the infrastructure for the projects is to be established in a manner so that they are grid compatible
  - Mini grid provisions

Normally for development of micro hydro projects clearances are required from:

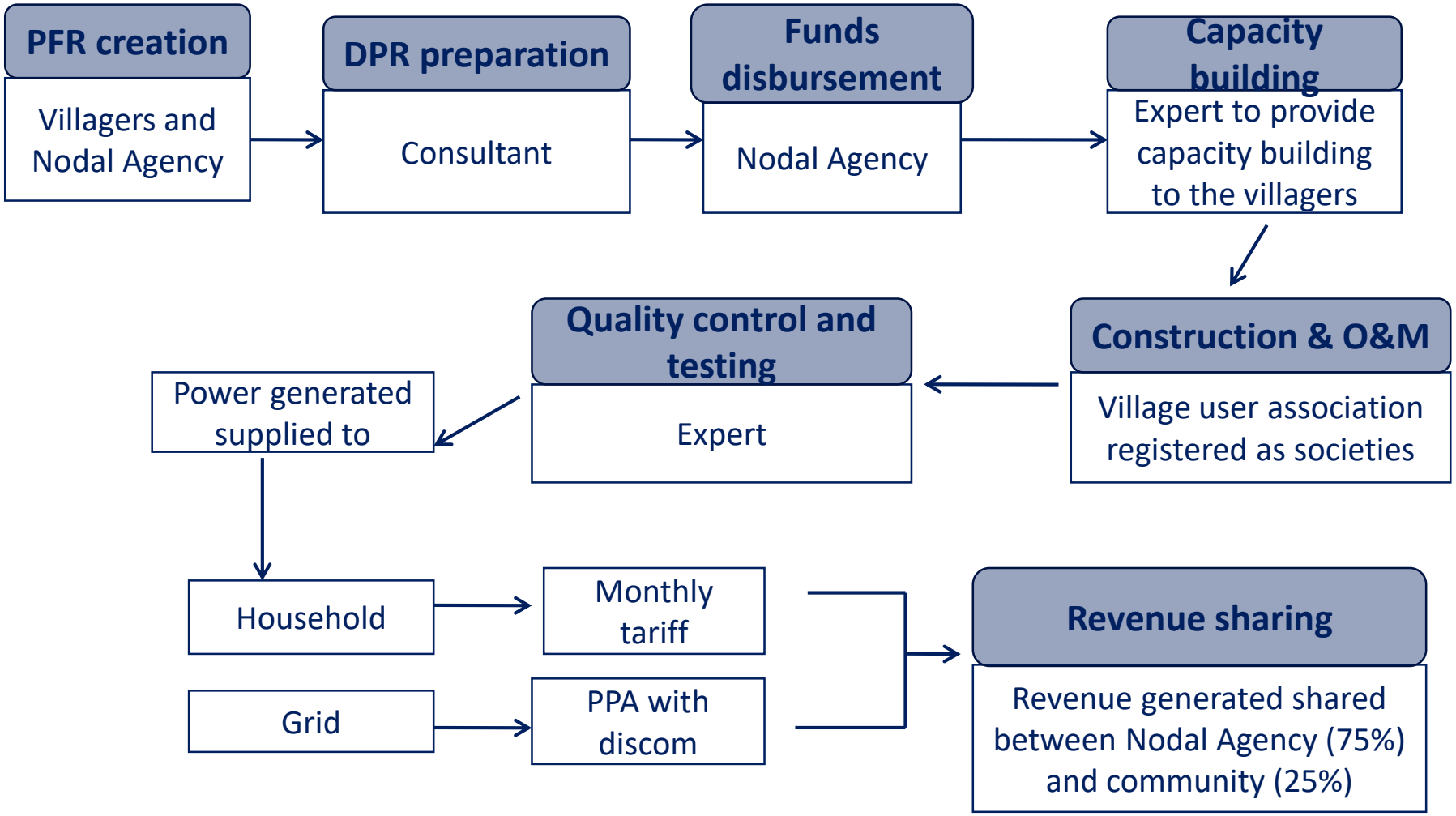
- Energy and Power Department
- State Pollution Control Board
- Department of Forests, Environment & Wildlife
- Irrigation and Flood control Department
- Department of Fisheries
- Land and Revenue Department
- Water supply deptt
- Public works deptt for road
- In some state from village panchayats

Existing Ownership Model for off-grid rural electrification

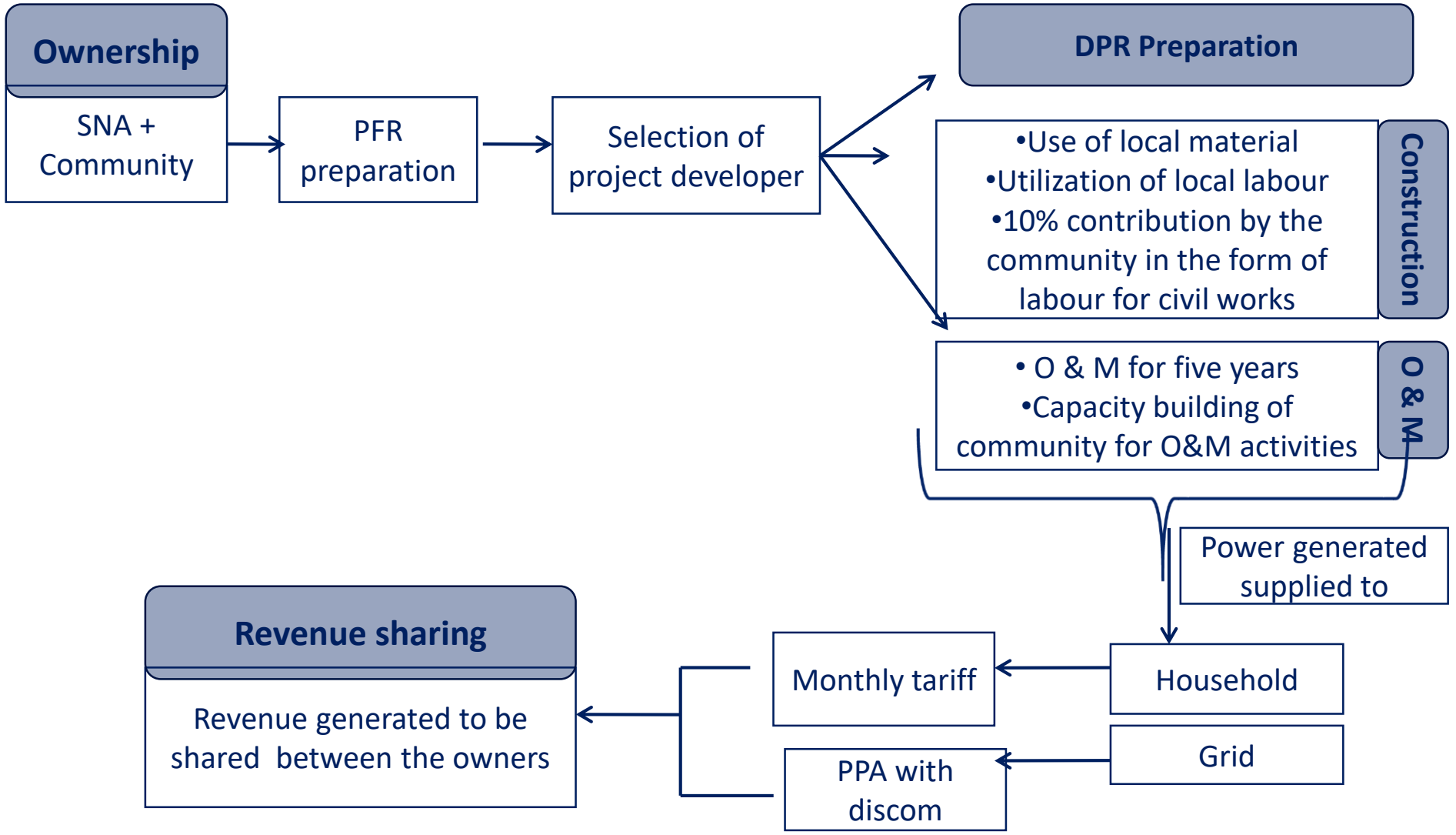


Gap between O &M cost and revenue recovery to be reimbursed by the Implementing Agency out of its service charges

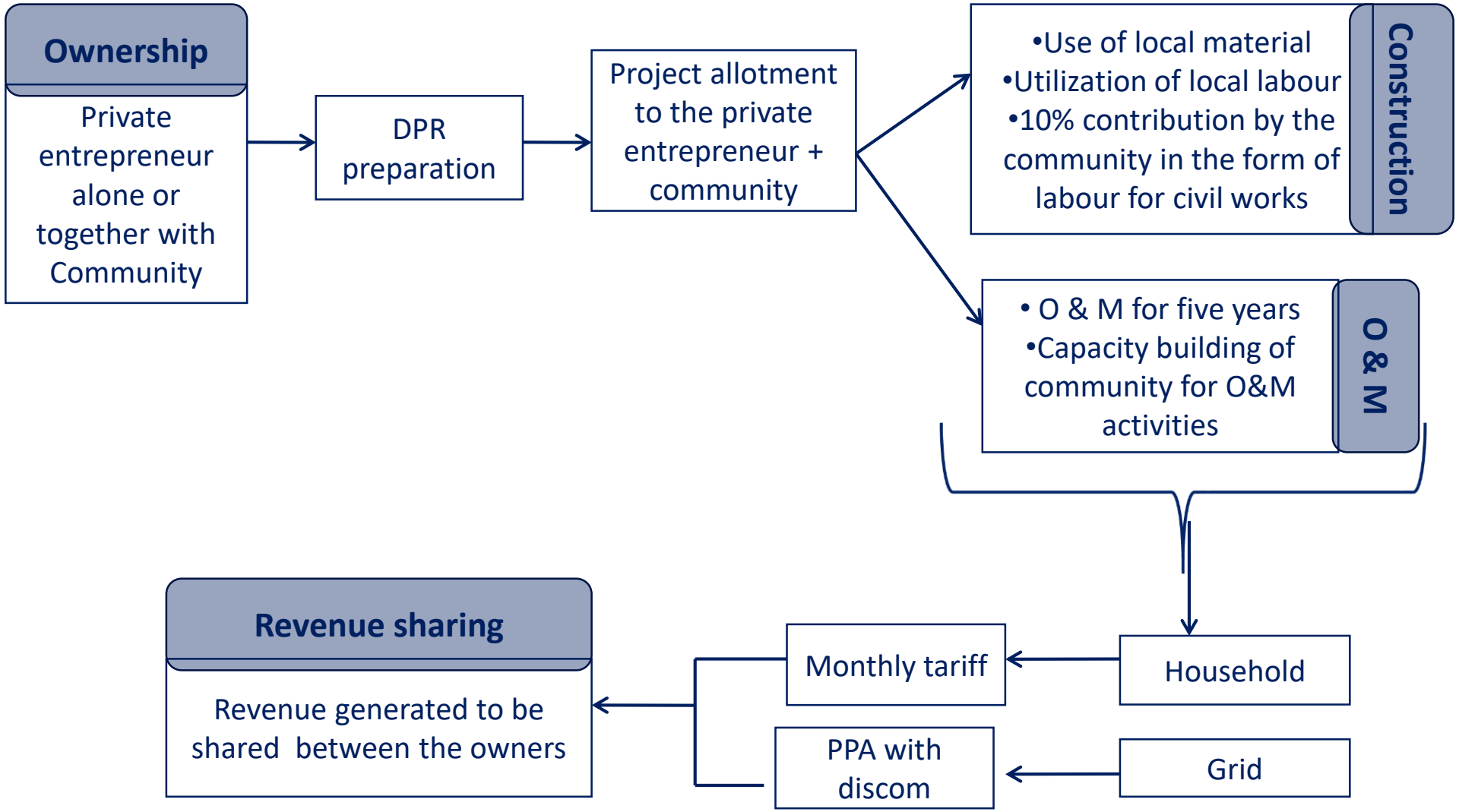
Existing Ownership Model for grid-connected projects: Uttarakhand



Ownership Models: Option 1



Ownership Models: Option 2



Cross linkages with other programmes

- Backward linkages
  - Rural electrification policy
  - Central financial Assistance
  - DDG scheme
  - Rural Management and Development Department
  - Others

- Forward linkages
  - Rural development programmes: 31 livelihood schools are coming up in Sikkim
  - Use of tail race water for irrigation as required by the village

Mini and micro hydro projects will be integrated with irrigation, education, health, drinking water, small-scale industry & ropeways

The women's development, irrigation, drinking water, community saving, health, forests, industries, environmental conservation, road, micro-finance, literacy campaign programmes, which are conducted at the local level will be implemented by integrating with the rural energy development programmes

'Nepal Rural Energy Policy 2006'

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Thank you