



Lessons and good practices in planning, market and investment promotion for Renewable Energy



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how to build 2030 RE road map in China

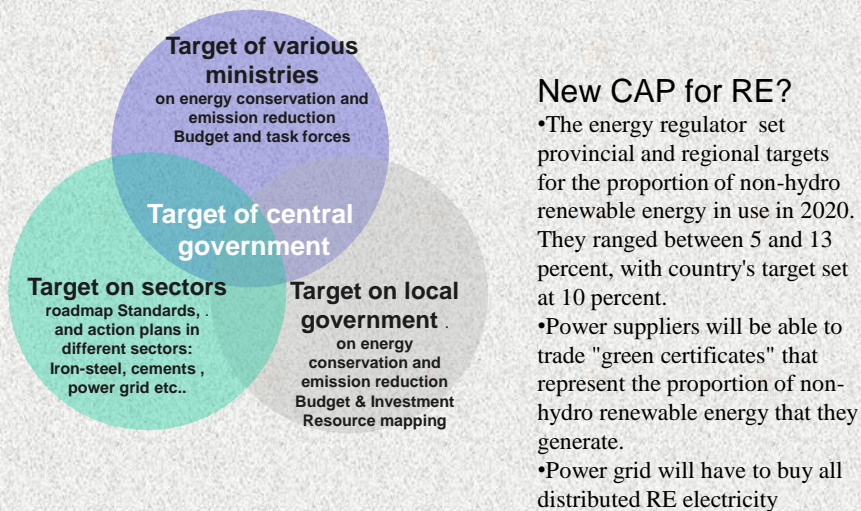
Main Activities

- Build upon the previous work done by NDRC/ ERI for the Chinese government on setting the RE target for 2020
- Analyse the significance of a high RE share of the energy mix in comparison to other scenarios
- Examine China's inherent RE resource potential, including technically viable resource quantities, available land area, water potential, grid capability etc.
- Depict China's RE development roadmaps with supply curves and forecasts of RE cost competitiveness
- Set appropriate RE targets in view of resource availability, cost effectiveness, and sustainable development demand
- Summarise the challenges to realising the targets, the key projects needed, and the necessary policy instruments
- Make an in-depth scenario analysis in analysing the 30% target and other possible targets

Expected output 2030 RE road map in China

- In order to set up a solid basis for China to achieve its renewable energy target, more investment should be provided on technology innovation, policy and institutional capacity:
 - Improve and promote renewable energy development plan;
 - Introduce renewable energy quota system;
 - Increase financial support, such as renewable energy fund, tax reduction etc.
 - Improve renewable energy market system;
 - Further research on resource evaluation;
 - Promote industry's technology R&D capacity.

Target distribution

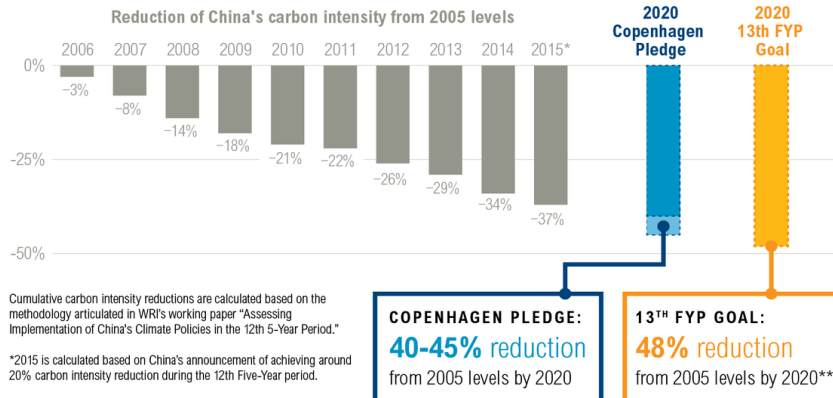


Capacity building: Investment in Skill Development

- Until the recent emergence of labor shortages, China's manufacturing sector has benefited from a growing pool of young workers trained for production jobs in government-run vocational schools. At the start of the reforms in 1980, only 19 percent of senior high school graduates came out of vocational schools. By 2001, however, driven by a policy to emulate Germany's dual-track training system, the proportion of senior high school students graduating from vocational schools was much larger: 45 percent or about 6-7 million vocationally trained graduates each year. This policy ensured that 90-100 percent of the young workers joining China's factories would be well-trained.

China carbon target

With 13th Five-Year Plan, China Sets Stronger 2020 Carbon Intensity Target



Why 11% Chinese wind power capacity be “wasted”

For years, the Chinese government has pushed a rapid build out of renewable energy; the country now boasts the highest renewable energy growth rates and the most wind and solar capacity of any country in the world.

But now it has, at least temporarily, overbuilt. In those energy-dense regions, there is more wind and solar capacity than there is transmission to carry it. So a lot of that power is going unused.

The energy-nerd term for power plants being cut back or shut down, even when they are capable of producing energy, is "curtailment." Grid operators curtail the incoming flood of wind and solar energy when they don't have the grid capacity to handle it.



How to finance RE for country with limited public budget



Equity

Equity finance refers to money invested in a company in return for a share of the ownership and profits of the business. These funds can provide equity investment capital for renewable energy, energy efficiency, or other environmentally responsible technologies in return for a share of the equity of the project.

Private equity

Investment by private investors taking an equity stake in companies not listed on a stock market. This includes: Venture capital, Replacement capital and Buyouts

Venture capital refers to investment in a company which has only recently been established, or is still in the process of being established. These investment funds seek high rates of return.

Quasi-Equity Mezzanine Finance

Financing that combines the features of debt and equity. The term covers a variety of instruments tailored to a specific legislative and operating environment.

Unsecured debt or preference shares offering a high return with a high risk. Ranked behind secured debt but ahead of equity. It may carry an equity kicker.

Debt

Debt financing is a financial instrument that provides capital for the purpose of earning interest for the lender. Different types of debt financing are currently being used for renewable projects and new ones are on the horizon. Debt financing can include non-recourse financing, development bank loans, and micro-credit loans, among others.

Sources of debt finance include:

- Commercial banks
- Multilateral lenders
- Funds and funds of funds

Project Finance

Project finance refers to financing of long-term projects based upon a financial structure where a mix of debt collateralised by the project and equity are used to finance the project

Asset Finance

Asset finance is a medium term instrument which can be used for financing fixed and moveable assets, such as machinery, equipment and buildings. The core principle of asset finance is leasing – the separation of ownership and use of a productive asset.

The key benefit of leasing is the relaxation of collateral requirements because the leased asset itself stands as main security.

A second advantage relates to the in-kind disbursement mode which may avoid other risks e.g. diversion of funds forex exposure, etc. However, rural lessors face high transaction costs for supervision of lessees, a lack of secondary markets for repossessed equipment, of appropriate insurance products and awareness amongst all stakeholders about the legal and operational features of leasing.

Guarantee

On the finance supply side, a guarantee encourages a lender or investor to avail finance to a specific project by promising to reimburse the lender or investor a pre-agreed proportion of losses that may be incurred in the event of default.

On the finance demand side, a guarantee can also serve as a substitute for collateral, thereby enabling the lender or investor to provide funds without requiring the project sponsor to provide all or some of the collateral

What is a financing package?

Simply = the project's organisation (players and mix of instruments) which define the project's finances

Some examples of packages for power sector investments

- Joint Ventures
- BOOT (build-own-operate-transfer)
- Turnkey Projects
- Management Projects
- Concession Projects

Conclusions and Recommendations

Every project is unique and the sponsors need to consider (i) the appropriate financing instruments and (ii) the appropriate financing package

Risk, the level of willingness to take that risk and availability of capital are key determinants of appropriate instruments and packages

Conclusions and Recommendations

Attracting sufficient private capital to fully develop energy opportunities in rural areas will require offering investors competitive financial returns.

For this to happen, developers must design projects that can withstand the due diligence criteria to which prudent investors will subject them to.

Prospective investors need to be convinced that risks have been anticipated, realistic business and marketing strategies have been devised and management possesses the experience to execute its business plan.

Providing a high level of comfort is critical with rural renewable energy projects because the perceived risks have historically discouraged investors.

PPP project: What is it?

- Medium to long term relationship between the public sector and the partners
- Involves sharing and transferring of risks and rewards between public sector and the partners
- Attempts to utilise multi-sectoral and multi-disciplinary expertise to structure, finance and deliver desired policy outcomes that are in public interest
- Clear governance structures established to manage the partnerships

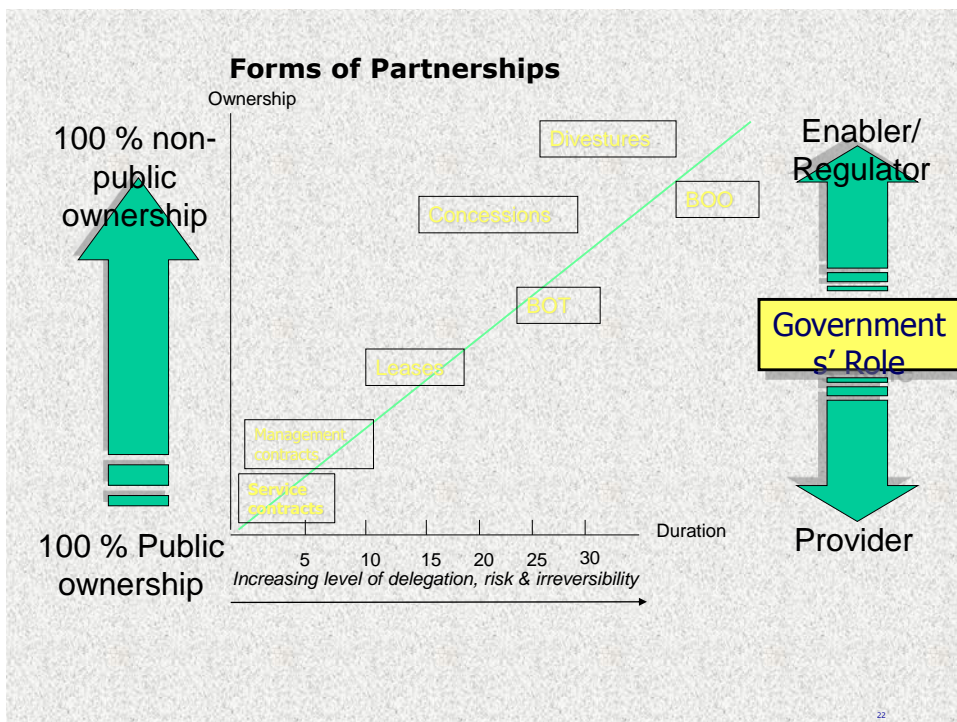
Critically...

- It is about creating, nurturing and sustaining an effective relationship between the Government and the private sector
- Achieving improved value for money by utilising the innovative capabilities and skills to deliver performance improvements and efficiency savings
- It aims to leverage private sector expertise and capital to obtain efficiency gains in service delivery and asset creation
- Life-cycle responsibility; value for money; output specifications; & risk transfer-fundamental but challenging aspects of PPP

Key structures

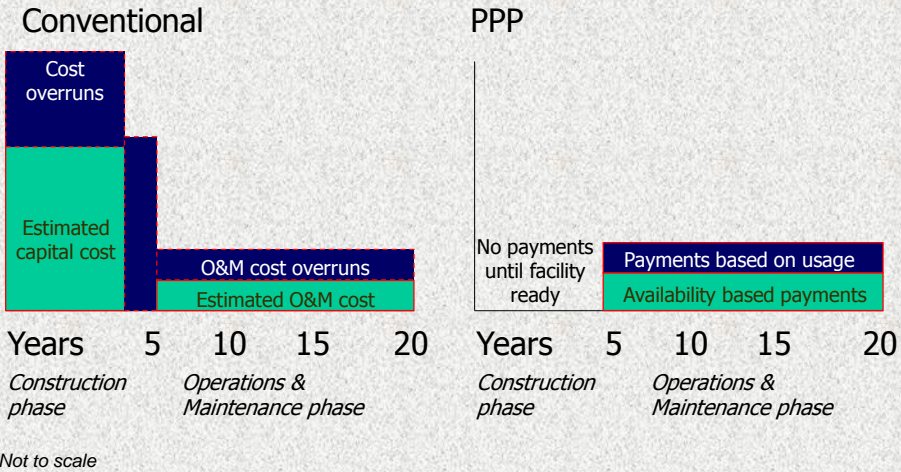
- Designed to maximize the use of private sector skills
- Risk placed where it can be managed best
- Activities performed by those most capable
- Public and private sector each retain their own identity
- They collaborate on the basis of a clear division of tasks and risks
- PPPs have a scope to offer to the public sector greater Value for Money:
 - PPP transaction facilitates technology transfer
 - Private sector shares its experience with public sector
- PPP can deliver high quality infrastructure in an efficient manner

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A Different form of procurement process



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Forms of concessions-I

Model	Description	Application
Build-Operate-Transfer (BOT)	<ul style="list-style-type: none"> Private investors are provided with a concession to finance, build, operate and maintain a facility during the concession period, the investor collects user charges from the users as a return to their investments At the end of the concession period the facility is transferred back to public authority on a pre agreed condition 	Developing highway networks, power plants, utilities sectors, air port, port and bus terminals
Build-Own-Operate (BOO)	<ul style="list-style-type: none"> Similar to a BOT model, without the transfer of ownership. Ownership is perpetual 	Telecommunication projects, waste water treatment plants, power plants
Build-Transfer-Operate (BTO)	<ul style="list-style-type: none"> The private sector parties builds a facility and transfer it to a public authority, after construction 	In projects with low private sector uptake

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Forms of Concession-II

Model	Description	Application
Build-Operate-Lease-Transfer (BOLT)	<ul style="list-style-type: none"> Similar to a BOT project, except that the transfer is carried out over the years by lease agreements 	Developing power plants, utilities sectors, port terminals
Lease-Develop-Operate (LDO)	<ul style="list-style-type: none"> Public authority retains ownership of the facility under a lease agreement. The lessee finances development and oversees the operation 	Airport facilities
Rehabilitate-Operate-Transfer (ROT)	<ul style="list-style-type: none"> Private sector rehabilitates and operates a facility during the concession period, and transfers the asset/facility to the public authority at the end of the period 	Sewage and water systems

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Presentation structure

- International experience summary
- The PPP Spectrum
- **PPP structuring and procurement process**
- Additional information
 - Case studies
 - Rationale for involving the private sector in infrastructure delivery
 - Illustrations/worked examples

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Selecting appropriate PPP candidates

- **Affordability:** Govt must STILL be able to afford to pay for the project, regardless of whether is it a traditional public project or a PPP. Deferred payment is not a real benefit of PPPs
- **Capital Investment:** The larger a project, the greater the risk of construction cost overruns, completion delays, or costs of inefficient operations & technology which a PPP can potentially better manage
- **Operating Life:** The project should require important levels of on-going maintenance & measurable performance
- **Technical, economic & environmentally sound:** PPPs should already have clear technical, economic & environmental feasibility. PPPs cannot, on their own, make technically or environmentally risky projects become feasible
- **Financial Viability:** PPPs do need to become financially viable to reach financial closure

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PPP feasibility analyses

- **Affordability:** Govt. contracting agency must demonstrate, through verifiable budget plans (5 yrs +), a level it can afford to pay for this needed project
- **Technical:** What is the level of demand for the new project over its whole life (20+yrs.)? What is the minimum performance of the project, expressed as outputs?
- **Economic:** What are the expected level of net economic benefits the project is estimated to provide (This is key in any decision on public sector support to the project, which must not exceed net economic benefit of the project)?
- **Environmental & Social:** What are the estimated environmental impacts & social costs from the project? Can they be reasonably mitigated?
- **Financial:** Based on estimates of construction & operating costs, and reasonable private sector returns, what does the tariff need to be? Can the user/Govt. contracting agency still afford it?
- **Legal & regulatory:** Does the project require a change in legal environment & how likely that can be achieved?

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PPP Project Selection Checklist

<ul style="list-style-type: none">• Is this project a clear Govt. priority (Nat'l Dev. Plan)? Are there initial indications (budget plans) that the Govt. agency can afford to make required payments for this project over its entire life (7, 10, 15, 20+ years)?	
<ul style="list-style-type: none">• Does the project require large, new capital investment (> \$50 million)?	
<ul style="list-style-type: none">• Does the project require long-term maintenance, measurable performance/ operations & periodic renewals?	
<ul style="list-style-type: none">• Are there initial indications the project is technically, economically & environmentally feasible?	
<ul style="list-style-type: none">• Are there previous int'l/regional/national examples of PPPs in the same sector? Are there indications of private sector interest?	
<ul style="list-style-type: none">• Are there clearly identifiable revenue streams (from Govt. or directly from public users)?	
<ul style="list-style-type: none">• Can project performance be measured in clear, quantifiable outputs and Key Performance Indicators (KPIs)?	

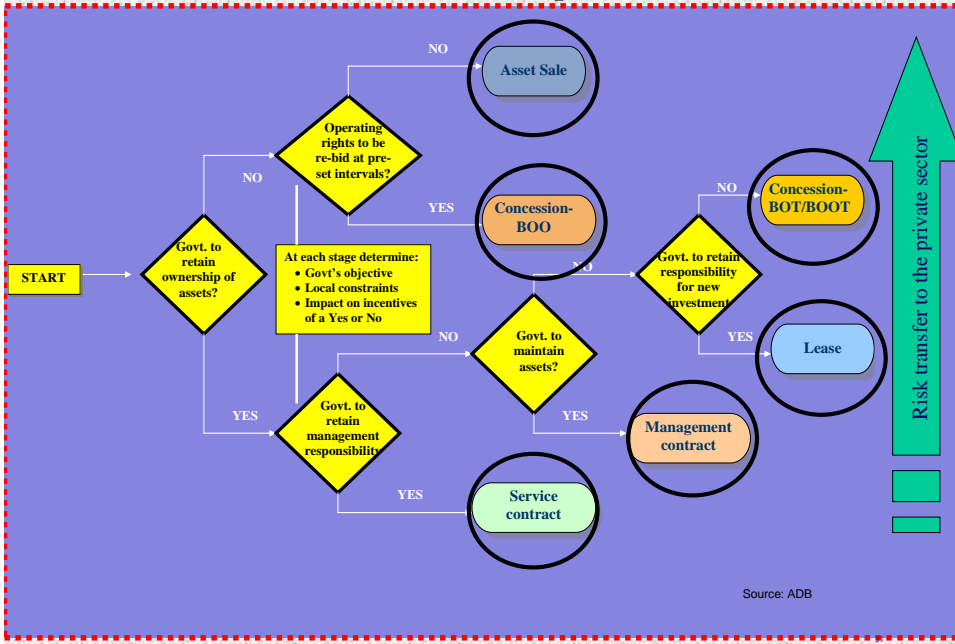
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How to decide on Options?

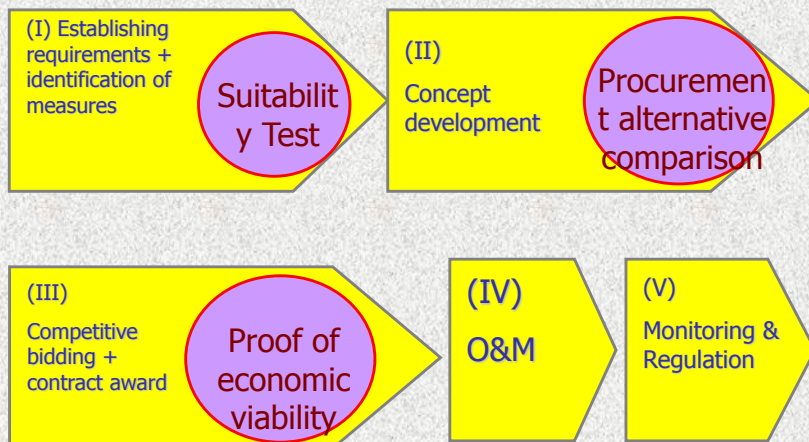
- Depends on:
 - Public policy considerations
 - Goals of the government
 - Expectations from the private sector in terms of targets, or service levels to be achieved
 - Condition & needs of the public sector agency
 - Political as well as institutional constraints

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Decision-tree for PPP options

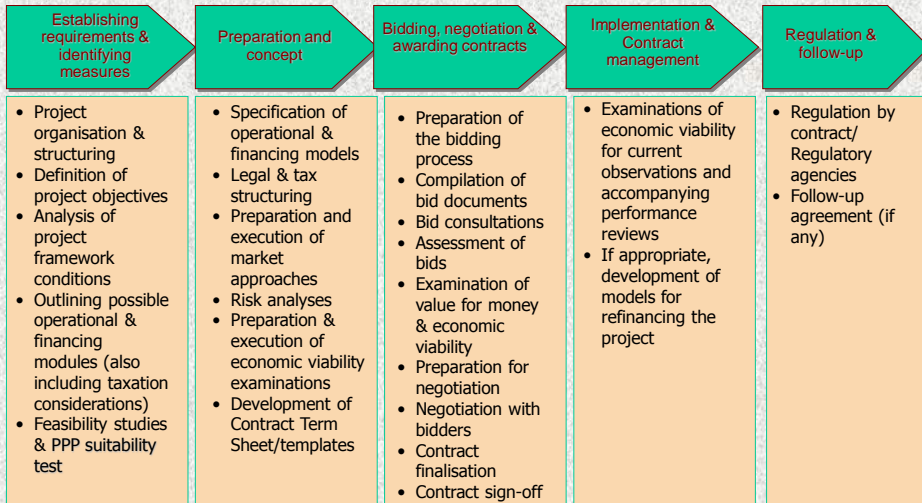


PPP procurement process



PPP only in appropriate projects and if positive effects are established!

Five Phases of a PPP Procurement



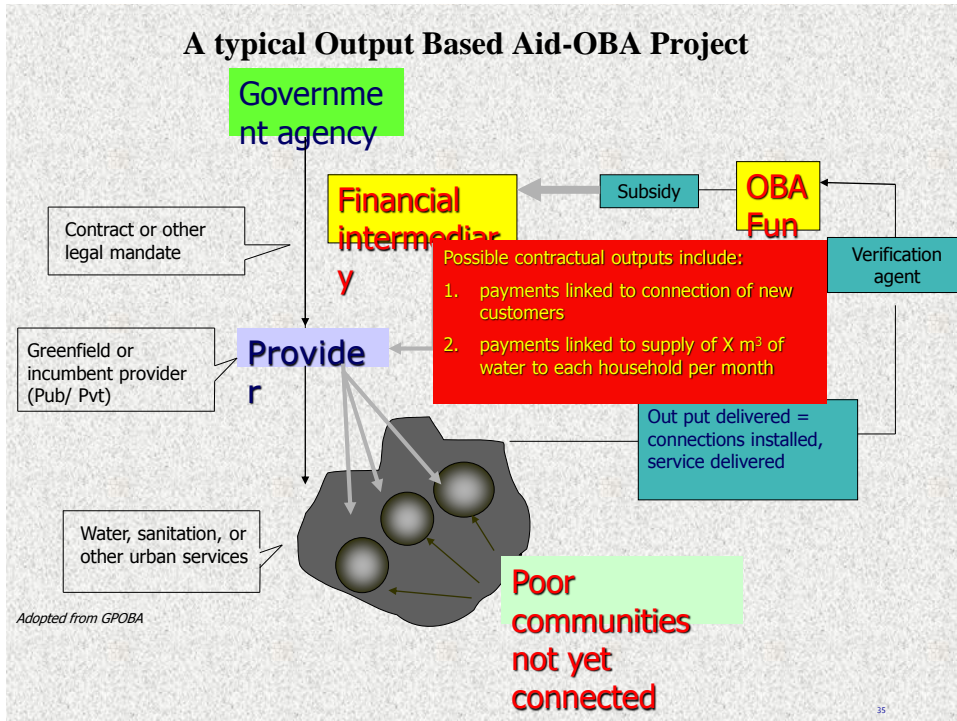
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Using Performance Based Subsidies in PPPs

Output-based aid (OBA) is a strategy for supporting the delivery of infrastructure services that depends –at least in part – on public funding where payment is linked to service delivery. At the core of the OBA approach is contracting out service provision to a third party – usually the private sector – with payment tied to the actual delivery of services.

- Road rehabilitation and maintenance traditionally done through input-based payments to private contractors
- Increasingly, output-based approaches, for example the Performance-based Maintenance and Management in Roads (PMMR) are used in Europe, Asia and Africa, and similar contracts have been functional for several years in Latin America (Argentina, Brazil, Uruguay)
- Expand private sector's role from simple execution of works to include maintenance, rehabilitation and management of road assets
- Operator paid after outputs delivered and quality standards met (per KM or similar)
- Multi-year and consumer-driven out-look, **shifting performance risk** to operator, and allowing for **innovation** and **efficiency**

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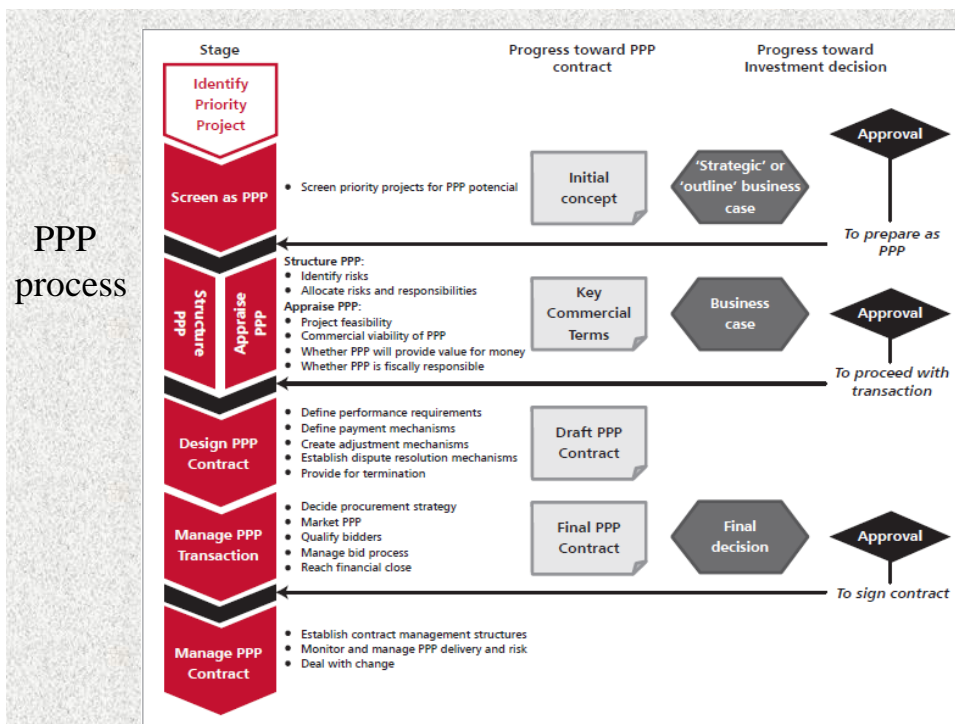


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Public Sector Comparator (PSC)

- How much *would* it cost the public sector to construct and operate the same project, with the same required outputs & levels of service?
- Requires:
 - A proposed project design that meets outputs
 - Estimates of construction costs
 - Estimates of financing costs
 - Estimates of operating costs over whole life of project
- What are the probabilities of, and the size of the impacts of, the risks that the Public Sector would assume in implementing this project?
 - Risk of construction cost over-runs
 - Risk of delays in completion of the project
 - Risk of higher-than-planned operating costs
 - Other relevant risks on the Government
- Based upon factual analysis of data on past public projects

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Thanks!

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