



## ACTION AREA 6: AFFORDABILITY AND OPTIMISING FINANCE

### Key messages

- The socioeconomic returns for each infrastructure project must be carefully appraised, and issues of inclusivity and affordability clearly considered from the outset in each project's business case.
- In many cases, the socioeconomic returns from infrastructure (as can be shown in the economic Cost Benefit Analysis (CBA)) are higher than the financial internal rate of return from tariffs, etc. Viability Gap Funding (VGF) may be appropriate in these cases and should be carefully targeted.
- Affordability of tariffs and infrastructure services for low-income groups is an important aspect of ensuring inclusive infrastructure and enabling universal access to basic services.
- Willingness to Pay (WTP) and Ability to Pay (ATP) must be evaluated to determine affordability barriers for low-income people and other vulnerable groups.
- Financial assistance may be used to bridge affordability barriers to targeted users (e.g. low-income groups). The various options by which subsidies can be applied must be carefully evaluated.
- A project's revenue streams may be a combination of government funding (from taxpayers), user charges, and other ancillary revenue streams
- To be inclusive and sustainable throughout its lifecycle, an infrastructure service must be both (i) affordable to the targeted end users; and (ii) have adequate revenue streams to meet its debt obligations and enable its safe operation and maintenance.

Three key practices have been identified under this Action Area for which further detail and guidance is given in the sections below:

Business Case

Willingness and Ability to Pay

Financial Assistance and  
Subsidy Instruments

## DEFINITIONS AND CONTEXT

### Definitions

The **Business Case** is the document that articulates the rationale for undertaking an investment. A well-prepared business case enables government decision-makers to understand the key issues, the available evidence base, influence appropriate scope and select the best option for delivery. The G20 *Principles for the Infrastructure Project Preparation Phase*<sup>157</sup> set out a list of critical aspects to consider in the Business Case under the dimensions of project rationale, options appraisal, commercial viability, long-term affordability and deliverability. Additional guidance on the preparation and uses of Business Cases is found in Chapter 5 of the GI Hub's Reference Tool on *Governmental Processes Facilitating Infrastructure Project Preparation*<sup>158</sup>.

The term **Affordability** can vary in meaning, depending on the perspective being considered. Affordability of the project from a government's perspective often refers to the project's ability to be accommodated within the government's current and future budget constraints. From the perspective of end users, the affordability of tariffs will relate to their ability to pay the tariffs or other user charges associated with the infrastructure in question and not be excluded from accessing the service, which may be a particular concern for low-income groups.

A gap may exist between the level of tariffs or user charges that can be charged to end users and the revenues required to meet the project's costs, and governments can use various mechanisms to close this gap. The use of cross-subsidy structures, government subsidies and ancillary revenue arrangements can be used to help address this situation.

Guidance on these mechanisms can be found in the 2016 World Bank publication *Financial Viability Support: Global Efforts to Help Create Commercially Viable PPPs*<sup>159</sup>.

The two aspects of affordability – from the government fiscal perspective and the user perspective – are linked. Since there are typically constraints on public budgets, careful attention needs to be given to the design and delivery of efficient and well-targeted subsidy mechanisms.

**Ability to Pay** (also sometimes known as Affordability to Pay or ATP), is a measure of end users' spending capacity and is typically based on their household income and expenditures.

**Willingness to Pay** (WTP) is a measure of the maximum amount that a consumer will agree to pay for the use of an infrastructure service such as water, electricity or public transportation.

A critical appraisal of the WTP and ATP of end users needs to be made in the Business Case for infrastructure projects and during the tariff-setting process. Vulnerable groups with the lowest income levels are particularly price-sensitive. Their spending capacity, preferences and expectations, as well as the benefits they derive from the infrastructure service, must be carefully considered.

**Financial Assistance** can take the form of government subsidies for the provider (the project company) and/or the end users of the services, with the aim of promoting the government's economic and social policy objectives.

<sup>157</sup> Found at [http://www.g20.utoronto.ca/2018/principles\\_for\\_infrastructure\\_project\\_preparation.pdf](http://www.g20.utoronto.ca/2018/principles_for_infrastructure_project_preparation.pdf)

<sup>158</sup> The complete Reference Tool is available at <https://www.gihub.org/project-preparation/>

<sup>159</sup> Financial viability support: Global efforts to help create commercially viable PPPs, (The World Bank Group, 2016)

## Context

Infrastructure should be carefully planned and designed to meet the needs of end users, and to use public financial resources in line with country-specific policy, strategies and regulations.

As set out in the G20 *Principles for the Infrastructure Project Preparation Phase*<sup>160</sup>, each project Business Case should consider the dimensions of project rationale, options appraisal, commercial viability, long-term affordability and deliverability.

This appraisal must consider the project's financial viability and its affordability from the perspective of both end users and the government:

- Infrastructure needs to be financially viable, in that the funding received, whether through end user tariffs or from taxpayers through government budgets, must be adequate to meet the cost of operating and maintaining the infrastructure assets, as well as meeting any obligations to repay the financing for its initial construction. This objective will lead to a focus on 'cost-reflective' tariffs, since without adequate funding to maintain the asset, it will deteriorate, which will lead to reduced access and poor service levels.
- Governments also strive to serve their citizens' needs and to maximise infrastructure usage by setting tariffs that are affordable for end users. More affordable charges to end users will increase access, leading to better socioeconomic returns. To achieve universal access to infrastructure, the cost of usage (i.e. a bus or train ticket, an electricity connection fee or a water usage charge) needs to be affordable for all.
- In addition to being affordable to end users, and financially sustainable in terms of having adequate funding and operational revenue, infrastructure is a substantial investment and must also be affordable from the government's fiscal perspective – which means that the financial commitments of the government to the project (in the form of direct funding or subsidies) must be accommodated within the government's current and future budget constraints<sup>161</sup>. Governments also need to be cognisant of the contingent liabilities which the state is assuming in respect of infrastructure projects, in the form of payments or assumptions of liability that may arise if particular risks allocated to the government under a PPP materialise.

To ensure that the infrastructure is accessible, affordable (to both end users and the government) and financially viable, therefore, requires a detailed analysis of the costs and benefits. When pricing is set to meet criteria, such as cost recovery and return on investment, there is a risk that low-income segments of society will likely be excluded from a given service. This may also overlook broader socioeconomic benefits to society, such as broader job creation, decreased pollution and better health outcomes. Targeted subsidies or concessional tariffs can help reach groups that cannot otherwise afford the infrastructure services. The choice of subsidy or tariff structure is often political, as well as economic, as each option has its advantages and disadvantages, as outlined below in the practice analysis.

The optimisation of pricing and use of financial subsidies is challenging. The need to reconcile securing an efficient pricing arrangement (which is important from an investor's perspective), with inclusivity and equity considerations (which are important from a public policy perspective) is a particularly complex task. For example, in the transport sector, government policies have sometimes only considered aspects of mobility, such as time-savings to motorists, rather than greater overall accessibility and increasing the affordability of transport for the poor<sup>162</sup>. To properly address the problem of achieving both efficient pricing and inclusive outcomes, it is helpful to focus more broadly on accessibility rather than just mobility, while at the same time trying to achieve affordability to ensure inclusive access. Given the need for fiscal affordability to government, it is important to have well-targeted and effective measures to assist low-income and other vulnerable groups, and to eliminate waste of resources through inefficient targeting<sup>163</sup>.

To help increase affordability, additional revenue opportunities can be useful, and should be considered in the project planning phase. For example, public transport projects can derive income both from passengers (via fare payments) and, potentially, from adjacent businesses benefitting from the additional traffic caused by the new transport service (via increased taxes or other revenue-raising schemes). Infrastructure can also create new business opportunities: for example, advertisers will pay for space on billboards near train platforms, and drivers can be charged for parking their cars close to the stations. In the case of the Mi Teleférico cable car system between La Paz and El Alto in Bolivia (see *Mi Teleférico Cable Car Case Study* in Section 4), complementary revenue streams represent 15% of the total revenue. The project achieved a financial surplus of USD 5.8 million within five years, entirely from farebox collection and this additional complementary revenue.

<sup>160</sup> Found at [http://www.g20.utoronto.ca/2018/principles\\_for\\_infrastructure\\_project\\_preparation.pdf](http://www.g20.utoronto.ca/2018/principles_for_infrastructure_project_preparation.pdf)

<sup>161</sup> Assessing Fiscal Feasibility (Affordability), (APMG International, n.d.)

<sup>162</sup> Transport Pricing and Accessibility, (Kenneth Gwilliam, 2017)

<sup>163</sup> Noting that some high-income countries, such as Luxembourg, are moving towards policies for free public transport, however the fiscal feasibility is likely to be limited in most economies.

## ANALYSIS AND GUIDANCE ON PRACTICES

### BUSINESS CASE

#### Overview

Infrastructure projects should use public resources in line with country-specific policy, strategies and regulations. Quantitative and qualitative social criteria that target inclusiveness can and should be embedded in national guidelines pertaining to the preparation of infrastructure project Business Cases.

At the heart of any Business Case is the appraisal and weighing up of costs and benefits. For inclusive outcomes, social parameters and measurements should be explicitly integrated in the Business Case development process. Integrating inclusive social parameters, criteria and measurements into each Business Case enables the explicit quantitative and qualitative consideration of such criteria.

In the past, it was suggested that there is, inevitably, a binary trade-off between equality and economic efficiency<sup>164</sup>. However, more recent commentators have noted that equality is an important ingredient in promoting and sustaining economic growth<sup>165</sup>. A properly-prepared Business Case allows decision-makers to make a comprehensive assessment of the costs and benefits of options, in terms of both efficiency and distributive effects, and progresses this assessment beyond a binary, zero-sum approach. The Business Case is an important process by which options can be appraised and projects can be carefully designed so as to reduce inequality and maximise social benefits, thereby promoting economic growth. In contrast, poorly designed projects that do not adequately address the needs of disadvantaged groups can have the effect of limiting the potential for such growth.

During the development of the Business Case, different scenarios can be analysed. Both quantitative (e.g. level of availability and accessibility) and qualitative (e.g. perception of safety and sense of community) parameters should be considered.

#### Relevance

To develop the Business Case, costs and benefits are, ideally, quantifiable. One of the challenges is that social parameters and benefits are, frequently, not easily measurable (in terms of valuations in monetary units), and lend themselves more readily to qualitative evaluation. Nevertheless, there is scope to better integrate social parameters in the project development process.

<sup>164</sup> Equity and Efficiency: The Big Tradeoff, (Okun, 1975)

<sup>165</sup> Inequality and Unsustainable Growth: Two Sides of the Same Coin? (Berg and Ostry, 2011)

#### At the policy level:

- *Integrating social considerations into policies and guidelines to steer Business Case development.* Social parameters should be integrated in national policies and guidelines that guide the preparation of Business Cases for infrastructure projects. Social formulae may be included alongside more financial, environmental and technical criteria. This also provides transparency in terms of objectives and expected outcomes.

#### At the project level:

- *Including social formulae in the Business Case for every infrastructure project.* Social inclusion parameters should also be clearly integrated at the project level. Since Business Cases typically require costs and benefits to be calculated over a specified timeframe, a reasonable estimate of the duration and the expected socioeconomic returns must be developed.

#### Guidance

##### 1. Consider inclusivity from the outset in each infrastructure project Business Case.

The Business Case for an infrastructure project can be prepared following various models, such as the UK Government's Five Case Model<sup>166</sup> that helps produce business cases for projects which use public spending. It involves the consideration of strategic, economic, commercial, financial and managerial criteria. From an inclusivity perspective, the economic case is particularly critical, as it determines the net value to society (the social value) of the proposed project.

The Business Case should involve an appraisal of the impact of the proposed project – and its alternatives – on society, and the costs of risks and mitigation measures. Depending on the desired impact, a preferred optimum balance between costs, benefits and risks to society will be made. This also leaves room to integrate and weigh-up qualitative aspects in the decision-making process. A description of the key appraisal steps in Business Cases, based on the UK Government's guidance, is provided on the next page:

<sup>166</sup> The Green Book, Central Government guide on appraisal and evaluation, (HM Treasury, 2018)

### DESCRIPTION OF KEY APPRAISAL STEPS

The rationale for the project is the first step. This should be used to identify the objectives or outcomes that the government wishes to meet through the infrastructure investment.

A long-list of options considers how best to meet the government's objectives with a wide range of possible approaches. They should be appraised for viability and filtered down to a shortlist.

A shortlist appraisal follows and is at the heart of the economic appraisal, where expected costs and benefits are estimated, and the trade-off is considered. This is done using Social Cost Benefit Analysis (SCBA) or Social Cost-Effectiveness Analysis (SCEA).

Identification of the preferred option is based on a detailed analysis at the shortlist appraisal stage. It involves determining the option with the best balance of costs, benefits, risks and other unmonetisable factors.

Monitoring refers to the collection of data, during and after implementation, to improve current and future decision-making. Evaluation is the systematic assessment of a project's design, implementation and outcomes. Both monitoring and evaluation should be considered before, during and after implementation.

Source: The Green Book, Central Government guide on appraisal and evaluation, (HM Treasury, 2018).

## 2. Incorporate Social Cost Benefit Analysis in the Business Case and include key inclusivity indicators.

### SOCIAL COST BENEFIT ANALYSIS (SCBA)

SCBA is an appraisal tool that is used to evaluate how public investment projects benefit society. It is an economic Cost Benefit Analysis that incorporates non-monetary outcomes by converting them into a monetary value, such as environmental impacts, time savings, health benefits, and accident costs (for transport projects). SCBA is an economic model which attempts to quantify social outcomes, whereas the financial CBA considers only the financial model related to investment and its Financial Internal Rate of Return (FIRR).

All groups in society need to be considered when developing a SCBA. For example, when users or consumers pay for a bus fare, they want the fare to be as cheap as it can be. At the same time, the bus operators or suppliers want the fare to be set as high as possible, so they can regain their costs. Bus drivers want an increase in their salary at least in line with inflation, and society as a whole wants further investment in better, cleaner, more frequent transport services.

All of these views need to be considered as part of the decision-making process.

The analysis of the prices, costs and intangible benefits from the perspective of consumers, suppliers and society makes up the SCBA.

Source: Atkins internal

The results of a SCBA should be clearly summarised and supported by more detailed analysis. Given the challenges of measuring social factors, key assumptions should be stated, and any additional non-monetised costs and benefits shown. Despite monetising social and environmental aspects, a SCBA may be blind to distributional issues.

An illustrative example of a SCBA and the resulting Net Present Social Value is shown on the next page in *Box 19: Illustrative example - Social cost benefit analysis in an appraisal model for a land remediation project, United Kingdom.*

### BOX 19: ILLUSTRATIVE EXAMPLE – SOCIAL COST BENEFIT ANALYSIS IN AN APPRAISAL MODEL FOR A LAND REMEDIATION PROJECT, UNITED KINGDOM

Officials are appraising the remediation (treatment) of 15.8 hectares (39 acres) of contaminated land to be funded through a public sector grant. The clean-up of the land would enable new businesses to move closer to an existing cluster of firms in a highly productive sector. The positive outcomes of the intervention can be estimated by the change in the land value of the site (land value uplift), and the health and environmental effects. There is data on the current and likely value of the land, post remediation. For simplicity, it is assumed all values below are already appropriately discounted.

VARIABLE	VALUE IN GBP
Existing use land value estimate	(1,200,000)
Future use land value estimate	9,820,000
Total land value uplift	8,620,000
Wider social benefits	1,400,000
Present value benefits (PVB), including land uplift, health and environmental effects	10,020,000
Present value cost (PVC)	(10,000,000)
<b>Net present social value (NPSV)</b>	<b>20,000</b>
<b>Benefit cost ratio (BCR = PVB/PVC)</b>	<b>1.002</b>

In this appraisal, the project is viable with a positive NSPV of GBP 20,000. The total amount is GBP 10,020,000 when wider social benefits of GBP 1.4 million are added to create the project value as a result of the remediation. The benefits exceed the costs of the remediation only when the wider social benefits are considered. Under the more inclusive assumptions, the project is implemented based on a positive NPSV and a BCR higher than 1.

Source: Ministry of Housing, Communities and Local Government, United Kingdom, The Green Book Central Government guide on appraisal and evaluation (HM Treasury, 2018)

### 3. Consider the use of Multiple Criteria Analysis to appraise large infrastructure projects in order to present monetised and non-monetised impacts of projects to decision-makers.

Multiple Criteria Analysis (MCA) is an umbrella term used to describe various types of approaches used to assist decision-makers to take explicit account of multiple criteria in finding a solution<sup>167</sup>. It is a social-technical process, including scoring and weighting, used by public entities to appraise prospective infrastructure developments. While not as common an appraisal analysis as Cost-Benefit Analysis (CBA) or Cost-Effectiveness Analysis (CEA), MCA offers a complementary method to overcome some of the shortcomings of traditional cost-benefit studies<sup>168</sup>.

SCBA is a normative procedure that prescribes whether the benefits of a project outweigh its costs on a monetary measurement basis. Based on the efficiency criterion, CBA analysts will inform decision-makers about the trade-offs they should make and pass judgement on the quality of their choices.

Instead of making normative recommendations, MCA analysts only describe and inform decision-makers on the nature of those trade-offs.

The main role of MCA is to deal with the difficulties that decision-makers have in handling large amounts of complex and often conflicting information in a consistent way. It adds economic, social and environmental dimensions to the appraisal. It brings a degree of structure, analysis and openness to the decision-making process and goes beyond the practical reach of a CBA analysis. MCA is typically more inclusive of stakeholders' opinions and preferences than the CBA. An MCA analysis performed very early in the project planning and design can usefully guide the inclusion of additional economic, social and environmental considerations<sup>169</sup>. MCA has been typically used to filter rather than to make final decisions, and can help because it is faster to process than CBA and helps evaluate impacts that cannot be fully quantified, however, there is a risk of double counting benefits in an MCA that would be well-managed in a properly conducted SCBA.

Various types of MCA approaches have been developed. One such approach is the Policy-Led Multi-Criteria Analysis (PLMCA) that seeks to achieve closer alignment with government policy across a wide set of objectives, including conflicting policy objectives<sup>170</sup>. Another MCA approach is the Infrastructure Prioritization Framework (IPF)<sup>171</sup> developed by the World Bank. The IPF is a multi-criteria decision support tool that considers project outcomes along two dimensions: social/environmental and financial/economic. When large sets of small to medium-sized projects are proposed, resources for implementation are limited, and basic project appraisal data are available, the IPF can be used to inform decision-makers in regard to project selection priorities.

### 4. Integrate monitoring and evaluation processes on inclusion into the business case itself.

A robust monitoring and evaluation process is essential in order to ensure that long-term infrastructure projects continue to achieve the government's socioeconomic objectives. The UK Treasury's *Green Book: Central government guidance on appraisal and evaluation*<sup>172</sup> suggests that the planning for monitoring and evaluation should take place at an early stage, before the implementation of a project, and that it should continue through to the end of the project's lifespan. At each stage, specific inclusivity parameters should be integrated into the monitoring and evaluation arrangements.

<sup>167</sup> Multiple Criteria Decision Analysis: an integrated approach, (Belton & Stewart, 2002)

<sup>168</sup> For example, people might feel more strongly about a project that imposes both environmental and social costs, than that which would be estimated by adding separate valuations of the two effects.

<sup>169</sup> Multi-criteria analysis: a manual (Department for Communities and Local Government, 2009)

<sup>170</sup> Theory and Background of Multi-Criteria Analysis (MCA): toward a policy-led MCA for megaproject transport infrastructure appraisal, (Ward, E.J., Dimitriou, H.T., and Dean, M., 2016)

<sup>171</sup> The Infrastructure Prioritization Framework: An Alternative Approach to Project Selection, (The World Bank Group, 2016), available at [https://library.pppknowledgelab.org/documents/3552?ref\\_site=kl&keys=prioritization&restrict\\_pages=1&site\\_source%5B%5D=Knowledge%20Lab](https://library.pppknowledgelab.org/documents/3552?ref_site=kl&keys=prioritization&restrict_pages=1&site_source%5B%5D=Knowledge%20Lab)

<sup>172</sup> The Green Book, Central Government guide on appraisal and evaluation, (HM Treasury, 2018)

## WILLINGNESS AND ABILITY TO PAY

### Overview

The determination of a fee, or tariff, for the use of an infrastructure service is common practice and usually involves an analysis of end users' ability to pay (ATP) and their willingness to pay (WTP)<sup>173</sup>. Knowledge and understanding of the ATP and WTP of end users should be reflected in the Business Case and assist in the formulation of accessible tariff structures, subsidies, grants or output-based aid (OBA) mechanisms.

ATP is a measure of affordability. When a set tariff is defined for access to an infrastructure service, there is a risk that certain groups or individuals may be excluded from using it, as the tariff level exceeds their ability to pay. This creates economic and social inequalities and disparities. Data analysis, stakeholder engagement and surveys can help to define critical affordability thresholds. Affordability is linked to the income of a person and his/her household budget. Although a number of 'rules of thumb' on the affordability thresholds of utilities expenditures as a percentage of income are sometimes

cited, these are not absolute, and are subject to trade-offs. For example, transport users may trade off housing costs for transport costs.

WTP can be independent of personal or household income, and can be affected by historical precedence (e.g. resistance to the introduction of water charges in a country where such charges did not previously exist); by perceptions of fairness and quality of service; and by the availability of other options (e.g. a non-tolled transport route).

An inclusive approach to ATP and WTP studies will involve applying the analyses to disaggregated groupings of stakeholders (by income level, gender, etc.) while also considering intra-household effects where there are members of the household who would not normally control expenditure.

Ability to pay should be considered alongside willingness to pay. There are standard approaches on how to conduct ATP and WTP analyses, but such studies are inherently problematic, and results can change over time depending on circumstances.

Some of the challenges of conducting ATP and WTP analyses are:

### CHALLENGES OF ABILITY-TO-PAY ANALYSIS

The ability-to-pay analysis, in the context of increasing the accessibility of certain infrastructure, requires a detailed understanding of the project's revenue, expenditure structure, inflation and other factors. The income of end beneficiaries and society groups at risk of not being able to access the infrastructure may be exposed to the negative impacts of climate change, job insecurity, and financial and political instability. This results in continuous change and fluctuation of household income. Additional micro and macro-economic factors (e.g. inflation) further impact spending capacity. Such circumstances and uncertainties create an additional challenge when identifying the ability to spend. To determine the most realistic numbers, income and expenditure variations need to consider fluctuations, dependencies and cost of living (housing, subsistence, education, leisure).

### CHALLENGES OF WILLINGNESS-TO-PAY ANALYSIS

The willingness-to-pay analysis is complicated because it relates to a moment in time and a specific situation in which choices are made (e.g. if undertaken during a drought when there is limited food, priority is given to food).

It is also subjective and requires the respondent to be honest and realistic in their self-assessment when asked during a survey.

As illustrated in the Kenya Last Mile Connectivity Program Case Study, WTP in the poorest households will be influenced by competing priorities.

Source: Accounting for Poverty in Infrastructure Reform, World Bank, 2002

<sup>173</sup> Willingness to pay is defined as the maximum price at or below which a consumer will definitely buy one unit of a product. The assessment is often not that straightforward as it depends on personal preferences, choices available and circumstance in which the decision is made.

## Relevance

### At the policy level:

- *Performing ATP and WTP analyses considering aspects of inclusion to increase accessibility and affordability.* Carrying out ATP and WTP studies with an inclusivity focus (i.e. studies that consider low-income and other vulnerable groups) can inform the policy development process and positively influence increased accessibility and affordability.
- *Combining analysis results with data to determine optimal tariffs or subsidies.* In combination with data collection and disaggregation, these studies can also help to set the tariff or subsidy at an optimal overall cost to the economy and society.

### At the project level:

- *Determining the bankability of a project through ATP and WTP analyses.* At project level, ATP and WTP studies are essential instruments to determine whether a project is affordable and bankable. If the analysis shows that the tariff needed to achieve financial viability will not be affordable, or that end users will be unwilling to pay such tariffs, then there is a possible need for financial assistance from the government to decrease the overall cost of the project.
- *Facilitating affordability discussions with funding entities through ATP and WTP studies.* Such studies can facilitate dialogues with government agencies and donor organisations on the subject of how the viability gap can best be addressed.

## Guidance

### 1. Prior to conducting ATP and WTP studies, collect and analyse relevant data using varied collection methods.

If disaggregated data from national statistics is used for ATP and WTP studies, it needs to be robust and available at the required level of detail. In the absence of robust disaggregated data, separate surveys and data collection efforts will have to be undertaken to estimate the gap between what a household can, and is willing to, pay for the proposed infrastructure service, and the actual cost of the service. One drawback with WTP surveys is that they are based on hypothetical questions rather than on actual payment behaviour<sup>174</sup>.

<sup>174</sup> Accounting for poverty in infrastructure reform - learning from Latin America's experience, (Estache, Foster, & Wodon, 2002)

### 2. Prioritise the poorest communities, given the vulnerability of their income and expenditure levels.

Individuals in the poorest communities need to allocate scarce resources to meeting basic necessities. For example, one of the findings in the *Kenya Last Mile Connectivity Program Case Study* was that, in the poorest communities, food and clothing were prioritised over access to electricity. In addition, ATP and WTP studies should take into account the fact that, in poor communities, incomes may be highly unstable and prone to fluctuation. Most exposed and vulnerable communities are impacted by seasonality and climate change, and they rely on global markets and commodity prices. Their income is dependent on various factors beyond their control, such as a stable political and financial environment.

Another example of the special circumstances affecting the poorest communities is provided by India where, despite the widespread availability and relative affordability of telecommunications services, not all segments of society use such services<sup>175</sup>. Several factors contribute to this, such as restricted mobility, lack of education, men's control over information, media content excluding rural women, etc. Poorer communities also cannot benefit from access to the internet if they are illiterate<sup>176</sup>.

### 3. Ensure the service quality matches the expectations of users.

Unreliable and inadequate supply is one of the reasons households 'opt out' of accessing infrastructure. People will be less willing to accept tariff increases where they have no confidence that the service will improve, or if they have suffered poor experiences in the past related to promises of improved service.

### 4. Consider differences in the local context, within a country or in the wider community.

The differences between communities in regard to their members' willingness to pay for particular types of infrastructure services may be significant. For instance, mobile users in sub-Saharan Africa spend, on average, 15% of their total income on mobile services. More people in sub-Saharan Africa now have access to mobile services than sanitation. In contrast, people in Chile with the lowest incomes are only willing to spend 2–3% of their earnings on communication devices. This is far below the cost of the technology needed to connect to the internet<sup>177</sup>.

<sup>175</sup> Topic Guide, Maximising the Benefits to the Poor from Infrastructure Programs aimed at Increasing Growth, (Hawkins, Wells, & Fernz, 2014)

<sup>176</sup> Topic Guide, Maximising the Benefits to the Poor from Infrastructure Programs aimed at Increasing Growth, (Hawkins, Wells, & Fernz, 2014)

<sup>177</sup> Topic Guide, Maximising the Benefits to the Poor from Infrastructure Programs aimed at Increasing Growth, (Hawkins, Wells, & Fernz, 2014)

### 5. Determine a minimum tariff value for the services provided.

Providing a service or infrastructure for free may not encourage responsible behaviour. For example, providing free water distribution creates a risk that users will not value the service, leading to overuse and a lack of general care and maintenance. Charges based on volumetric consumption of electricity can also promote more responsible use and maintenance. However, some countries have also opted to fully subsidise infrastructure access for a specified group of individuals (see, in the final sub-section of this Action Area, *Box 21: Illustrative example – Concessionary bus fares, free travel for older people and people with disabilities, United Kingdom*).

Setting a lifeline tariff for low consumption levels, and increased tariffs at higher levels, can also promote effective demand management.

### 6. Consider smaller projects when reaching out to vulnerable community groups.

Often more innovative solutions can be applied to smaller projects, with service levels being tailored to needs and affordability levels. The advantage of a smaller project is demonstrated by the United Nations Capital Development Fund's (UNCDF's) Unlocking Public and Private Finance for the Poor Local Finance Initiative (see *Box 20: Illustrative example - Integration of private sector financing in combination with output-based aid*).

#### BOX 20: ILLUSTRATIVE EXAMPLE - INTEGRATION OF PRIVATE SECTOR FINANCING IN COMBINATION WITH OUTPUT-BASED AID

The United Nations Capital Development Fund's (UNCDF) Unlocking Public and Private Finance for the Poor Local Finance Initiative is a flagship program that offers practical examples of public and private financing, and a platform for knowledge exchange for least developed countries (LDCs). LDCs suffer from chronic infrastructure deficits, which are even more pronounced in secondary towns and rural areas. Infrastructure finance has its own challenges, which are further increased when the social inclusion dimension is also considered. Therefore, the UNCDF focuses on financial inclusion and financing mechanisms for demographic groups with the least income.

#### Project example - Mpale Village 50Kw solar micro-grid in the Tanga region of Tanzania.

The following challenges had to be overcome to make the project financially viable:

- lack of economies of scale (due to the size of the project), making it a low return project that could not attract private capital during the initial stages;
- untested management model proposed by the project developer; and
- lack of interest by commercial banks to lend to greenfield projects.

The UNCDF provided a USD 124,000 seed grant and technical assistance, which helped to unlock the remaining 67% of total project cost from two public financing sources: the US Africa Development Foundation (USADF), and the multi-donor Energy and Environment Partnership (EEP) program.

The UNCDF financial and non-financial contribution is seen as a catalyst for the development of the project.

This project is the first of its kind in Tanzania to employ the energy daily allowance (EDA) system. The EDA system assigns a daily fixed amount of electricity to each household. This amount is calculated and agreed upon with each household and is based on the number of appliances and the number of hours each appliance needs to be powered through the mini-grid during a 24-hour cycle.

#### Outcomes:

- Improved operational efficiencies of small-sized businesses and the enabling of business expansion.
- Created non-agricultural employment opportunities for members of the community and adjoining villages.
- Cost savings for users, increasing their purchasing power and improving their economic situation.
- Access to electricity to aid in the diversification of the local economy away from primary agriculture.
- Access to electricity enables women to shift time spent on unpaid house work, such as collecting firewood and fetching water, toward income-earning activities and businesses. Lighting provides more security, so women-owned businesses can extend their trading hours into the evening. Also, girls will have more hours to study in the evening.

Source: UNCDF, [www.uncdf.org](http://www.uncdf.org), Case Study No. 2: Mpale Village 50Kw Solar Micro Grid

## FINANCIAL ASSISTANCE AND SUBSIDY INSTRUMENTS

### Overview

Thorough planning and appraisal of a proposed infrastructure project should be the first step in determining if financial assistance is required to improve the inclusivity of the project. When financial assistance is required, in the form of subsidies or otherwise, Social Cost Benefit Analysis (SCBA) can be used to appraise the subsidies and calculate their impact, including the fiscal, environmental and social impact of a proposed subsidy, as well as its distributional impact.

There are a number of different social, environmental and financial objectives in pricing and subsidies. While some aspects of these objectives can be complementary, others may be competing. These competing pricing objectives add complexity to setting the optimal pricing subsidy.

For example, urban transport pricing subsidies may be designed for environmental reasons or to reduce congestion; and the setting of tariffs based on the metering of a utility service (such as water or electricity), can play an important role in demand management and addressing environmental concerns, since end users are much more likely to curtail their consumption when supply is metered.

However, certain types of pricing strategy may raise concerns regarding equity and the impact on vulnerable groups. Tariffs established on the basis of cost recovery, or demand management, may not address affordability to low-income users. To address this problem, alternative pricing strategies and efficient financial assistance delivery ought to be considered<sup>178</sup>.

The effectiveness of subsidy measures to assist the poor can be assessed using inclusion and exclusion indicators from household survey data to measure targeting errors. Figure 10 illustrates how these errors of inclusion (when non-targeted groups receive the benefits) and errors of exclusion (when the targeted groups do not receive the benefits) can be calculated from household survey data.

Errors of inclusion (the share of benefits received by non-vulnerable people out of the total benefits available to both groups)

Errors of exclusion (the share of vulnerable people who did not receive benefits out of the total number of vulnerable people)

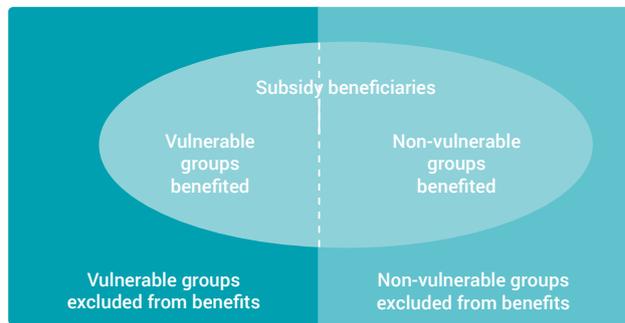


Figure 10: Errors of inclusion and exclusion in subsidy arrangements<sup>179</sup>

### Subsidy instruments

Subsidy instruments take many different forms, on both the supply and demand side.

Subsidies on the **supply side** (i.e. subsidies to project company service providers to facilitate the supply of an infrastructure service) are often unrelated to the welfare of the poor. Instead, they are mostly aimed at ensuring the viability of the service in the face of market difficulties.

These supply-side interventions in the transportation sector can take the form of capital grants given to public transport infrastructure, such as metro systems. These may have an efficiency justification in reducing traffic congestion, etc. but such subsidies do not specifically target low-income people. Accordingly, the welfare-distributing impacts of such capital subsidies will depend on who uses the subsidised services.

In contrast, subsidies on the **demand side** (i.e. direct subsidies to targeted end user groups), can directly address accessibility and equity problems. Demand-side subsidy instruments include income-based subsidies, journey-based subsidies and person-type subsidies. Figure 11 on the next page shows different types of urban transport pricing instruments<sup>180</sup>.

<sup>178</sup> Transport Pricing and Accessibility, (Gwilliam, 2017)

<sup>179</sup> Foster (2004) via Transport Pricing and Accessibility, (Gwilliam, 2017)

<sup>180</sup> For detailed discussion on the objective of each pricing instrument, see Gwilliam (2017)

SUBSIDY INSTRUMENTS		TAX INSTRUMENTS
SUPPLY-SIDE SUBSIDIES	DEMAND-SIDE SUBSIDIES	
Maximum fare control	Class-related fares	Fuel tax
Franchise rights	Peak surcharges	Tax on vehicle miles
Network support	Off-peak surcharges	Licence duties
Bus tender subsidies	Flat fares	
School bus subsidies	Location-specific fares	
Non-work journeys	Club subscriptions	
Vehicle capital grants	Commuting tokens	
Clean fuel subsidies	Student cards	
Earmarked taxes	Child fares	
Deficit system support	Senior fares	
Route subsidies	Disabled fares	
Tendered management contracts	Flat fares	
Off-peak discounts	Location-specific fares	
Labour subsidies		
Special transport cash subsidies		

Figure 11: Urban transport subsidy and taxation instruments

A leading example of a transport sector subsidy directed exclusively at travel by low-income households is the TransMilenio BRT system in Bogotá, Colombia (see *TransMilenio Bus Rapid Transit Case Study* in Section 4), where, in 2013, the city authority (with the assistance of the World Bank) introduced a system in which members of households with a low national poverty index score could opt for a public transport subsidy through a personalised smart card. This program has contributed significantly to

an increase in infrastructure services available to workers in the informal sector and other low-income groups.

In the design of subsidised tariffs for utilities such as water and electricity, both affordability and willingness to pay need to be assessed, as outlined above. Subsidies can be based on the concept of 'lifeline subsidies' to ensure a defined minimum standard of accessibility, or the subsidies can be provided on a 'means-tested' basis.

## Relevance

Where financial assistance is being provided in the form of subsidies at the sector or project level, these can be either on the supply side for service providers or on the demand side for users. The pricing strategy is also an important mechanism for the distribution of benefits and has a significant impact on the welfare of vulnerable groups.

### At the policy level:

- *Targeting vulnerable groups through subsidies within the country's overall tax regime.* Subsidy and pricing instruments can be used to target low-income or other vulnerable groups, and should be considered alongside the broader context of the overall tax regime and the social safety-net systems in the country. Sector-specific financial assistance may be appropriate for certain 'merit goods' that provide wider benefits to society and to end users, which are not fully recognised at the time of their use (e.g. safe sanitation, education, etc.).

### At the project level:

- *Applying subsidy instruments and financial assistance to ensure affordability.* Optimised financial assistance, delivered as subsidies and inclusive pricing strategies at the project level, can be effectively applied to ensure the project's affordability, accessibility and sustainability.

## Guidance

- 1. Assess the need for government financial assistance to projects having regard to the project's Business Case, using Social Cost Benefit Analysis as appropriate, in alignment with national strategies, such as ensuring universal access to basic services.**

Financial assistance from government may be required to ensure that a project is financially viable, where the social benefits of a proposed project outweigh the costs of such assistance. Direct subsidies to sectors can be targeted to ensure inclusion, and both the advantages and the potential disadvantages (such as the distorting effects of subsidies) should be carefully assessed. The efficiency of infrastructure subsidies should be assessed versus wider options, such as general cash transfers to the poor<sup>181</sup>.

- 2. Assess different options for targeting subsidies.**

Two broad approaches are available for demand-side subsidies in infrastructure. They can be based on the consumption level of households, in which case they are called 'lifeline subsidies'. Alternatively, the subsidies can

be based on socioeconomic characteristics, in which case they are referred to as 'means-tested subsidies'<sup>182</sup>. A lifeline tariff can target a minimum standard of service delivery, in accordance with national standards or as set out in the UN SDG targets – and such mechanisms can be designed so that wealthier end users with higher consumption levels are subject to higher tariffs. If there is a preference to use means-tested subsidies, there will need to be reliable systems to identify income levels which can be readily applied and are not subject to abuse. In some countries this can be challenging, and geographic targeting of poor districts is often used as a proxy for means-testing.

At the end of this sub-section, Box 21 presents an illustrative example of an application of concessionary bus fares and statutory free bus travel for the elderly and disabled in the United Kingdom.

- 3. Consider the use of cross-subsidies to provide eligible households a percentage discount on their bills, which is funded by a percentage surcharge applied to ineligible households.**

Under a cross-subsidy program, money raised from a surcharge to relatively wealthy end users goes to a special fund, from which subsidies can be paid to households that apply for and meet the eligibility criteria. As they are somewhat hidden, cross-subsidies often have the advantage of generating less opposition from those who pay the subsidies than general taxes, and they avoid the problem of tax evasion. However, cross-subsidies may generate larger economic distortions than general taxes, because the prices for both those receiving and paying the subsidies are distorted<sup>183</sup>.

- 4. Consider the use of subsidies to local governments or private sector providers against certain performance output (so called output-based subsidies, or output-based aid<sup>184</sup>) to incentivise inclusivity.**

Chile's rural electrification program, launched in 1994, created a special rural electrification fund (REF), whereby subsidies are linked to specified output targets. This fund competitively allocates direct subsidies to private distribution companies to cover part of their investment costs in rural electrification.

<sup>181</sup> Accounting for poverty in infrastructure reform - learning from Latin America's experience, (Estache, Foster, & Wodon, 2002)

<sup>182</sup> Accounting for poverty in infrastructure reform - learning from Latin America's experience, (Estache, Foster, & Wodon, 2002)

<sup>183</sup> Accounting for poverty in infrastructure reform - learning from Latin America's experience, (Estache, Foster, & Wodon, 2002)

<sup>184</sup> Output Based Aid is a subsidy that is disbursed only after achievement (and verification) of agreed outputs (often also called outcomes).

The distribution companies apply for a subsidy by presenting a project proposal, then the proposals are scored against a checklist of objective criteria, including cost-benefit analysis, operator investment commitment and social impact. The central government allocates subsidies to regions according to the number of un-electrified households and the progress each region has made in rural electrification during the preceding year<sup>185</sup>.

Another example of this type of subsidy is the Water Sector Trust Fund in Kenya (see related *Case Study* in *Section 4*), whereby payments are made to local service providers after construction has been completed in accordance with previously agreed output specifications. Under this program, the Trust Fund sends an independent assessor to complete a report on the works that have been constructed, and on the basis of this report the subsidy is disbursed.

**5. Establish and implement systems for monitoring and evaluating the use (and mis-use) and impact of subsidies. Determine inclusion and exclusion indicators<sup>186</sup> to measure the proportion of the target group that fails to benefit from the subsidy (exclusion index) and the proportion of people outside the target group benefiting from the subsidy (inclusion index).**

By undertaking this type of inclusion and exclusion analysis (see Figure 10 on previous page), governments can determine if a subsidy is achieving its objectives. This finding can be very important in the design and reform of subsidies. This approach was first applied to public transport in Buenos Aires<sup>187</sup> to evaluate the socioeconomic impacts of the infrastructure reforms of the 1990s.

When the objective to redistribute benefits from the defined non-vulnerable groups to the targeted vulnerable groups has been successful, then both exclusion and inclusion indicators should be close to zero (i.e. the subsidy is well-targeted and applied to the intended group).

## APPLICATION TO TARGETED STAKEHOLDER GROUPS

### Low-income groups

The targeting of subsidies and the pricing strategy used for infrastructure services are particularly important topics for low-income groups. In addition to assessing the household income of low-income groups on a stable basis, consideration should also be given to variations in income levels caused by events such as failed harvests, epidemics or job losses. In addition to the amounts paid by low-income groups for infrastructure services, consideration should also be given to non-financial barriers. For example, there are instances where poor families are actually paying more for their informal water supply than higher-income households are paying for water utility services, but the former group is unable to access the utility service due to the size of upfront connection fees, the need for a formal proof of address, or an insistence upon end users having a personal bank account.

### People living in remote areas

For people living remote from existing networks, the tariff implications and economic efficiencies of centralised versus decentralised supplies should be carefully assessed. In the power sector, the following mechanisms have been identified to make electricity supply more affordable and accessible for groups living in remote areas<sup>188</sup>:

- feed-in tariffs for renewable energy supply;
- rural distribution franchises: for example, in India, the distributed generation and supply (DG&S) model combines generation and distribution, e.g. in addition to distributing power and collecting revenues, the franchisee also generates power locally and supplies it to the franchised area<sup>189</sup>;
- innovative payment mechanisms (i.e., payments by mobile phone, and pre-paid services).

<sup>185</sup> Topic Guide, Maximising the Benefits to the Poor from Infrastructure Programs aimed at Increasing Growth, (Hawkins, Wells, & Fernz, 2014)

<sup>186</sup> Transport Pricing and Accessibility, (Gwilliam, 2017)

<sup>187</sup> Toward a Social Policy for Argentina's Infrastructure Sectors: evaluating the past and exploring the future (Foster, 2004)

<sup>188</sup> Empowering Rural India: Expanding Electricity Access by Mobilizing Local Resources. Analysis of Model for Improving Rural Electricity Services in India through Distributed Generation and Supply of Renewable Energy, (World Bank, 2010)

<sup>189</sup> Empowering Rural India: Expanding Electricity Access by Mobilizing Local Resources. Analysis of Model for Improving Rural Electricity Services in India through Distributed Generation and Supply of Renewable Energy, (World Bank, 2010)

### BOX 21: ILLUSTRATIVE EXAMPLE – CONCESSIONARY BUS FARES, FREE TRAVEL FOR OLDER PEOPLE AND PEOPLE WITH DISABILITIES, UNITED KINGDOM

Under the provisions of the Transport Act 2000, the statutory concession currently consists of guaranteed free off-peak travel for older people and people with disabilities on all local buses, anywhere in England, from 9:30am until 11pm on weekdays and all day on the weekends and on Bank Holidays. The concessionary bus travel is popular and successful, with almost 12 million pass-holders making more than 1.2 billion bus journeys in 2015/16. This statutory concession is complemented by voluntary concessions.

#### Objectives

The objectives are based on social inclusion and access.

The provision aims to enable people with disabilities and the elderly, especially those on low incomes, to use public transport. It recognises the role access to public transport can play in tackling social inclusion and well-being. It promotes greater freedom and independence.

#### Eligibility criteria

People with disabilities, as specified in section 146 of the 2000 Act, include:

- a) those who are blind or partially sighted;
- b) those who are profoundly or severely deaf;
- c) those without speech;
- d) those with a disability, or those who have suffered an injury, which has a substantial and long-term adverse effect on their ability to walk;
- e) those who do not have arms, or who have long-term loss of the use of both arms;
- f) those with a learning disability, that is, a state of arrested or incomplete development of mind which includes significant impairment of intelligence and social functioning;
- g) those who would, if they applied for the grant of a licence to drive a motor vehicle under Part III of the Road Traffic Act 1988, have their application refused; and
- h) those who are automatically eligible for free bus travel, such as recipients of the war pensioner's mobility supplement.

#### Older people

Eligibility criteria is as follows: "in the case of a woman, her pensionable age [and] in the case of a man, the pensionable age of a woman born on the same day".

The scheme is administered by travel concession authorities and funded with GBP 1.17 billion per year. The bus pass is particularly popular amongst older people.

#### Benefits

Each £1 of government expenditure on concessionary travel for older people and people with disabilities generates at least £3.79 in benefits, broken down as:

1. impacts for concessionary bus passengers;
2. impacts for other bus passengers and other road users;
3. wider economic impacts, especially those associated with volunteering; and
4. well-being, including physical health.

#### Discretionary fares

Local authorities have discretion over any concessionary fares they choose to offer in addition to the statutory concession (i.e. to students and older people not yet of pensionable age, which is currently 65 for men and 60 for women). Any such discretionary concessions are funded from general spending. Across England's bus network, more than one in five journeys are made using a concessionary pass.

#### The London Scheme

The London Scheme (known as the Freedom Pass) provides a standard concession for older people and people with disabilities. The scheme provides free travel for pass-holders on almost all public transport in London, such as buses, the Underground, the Overground and Docklands Light Railway, and National Rail services.

Sources: House of Commons Library, Briefing Paper Concessionary bus fares SN01499, 2015. The costs and benefits of concessionary bus travel for older and disabled people in Britain, Greener Journeys, 2017

## OVERVIEW OF ACTION AREAS ILLUSTRATED BY CASE STUDIES

While every infrastructure project should consider practices under each of the Action Areas, for illustrative purposes, the case studies (found in *Section 4*) have focused on specific Action Areas, as summarised below.

### BOX 22: PRINCIPAL ACTION AREAS COVERED AND TARGETED STAKEHOLDERS IN DETAILED CASE STUDIES

CASE STUDY	PRINCIPAL ACTION AREAS COVERED	TARGETED STAKEHOLDERS
<b>U.S. Bank Stadium, United States of America</b>	<ul style="list-style-type: none"> <li>3. Policy, Regulation and Standards</li> <li>4. Project Planning, Development and Delivery</li> </ul>	<ul style="list-style-type: none"> <li>Low-income groups</li> <li>Women and girls</li> <li>Minority groups</li> <li>People living with a disability</li> <li>Women- and minority-owned businesses</li> <li>Veterans</li> </ul>
<b>El Metropolitano Bus Rapid Transit, Peru</b>	<ul style="list-style-type: none"> <li>1. Stakeholder Identification, Engagement and Empowerment</li> <li>4. Project Planning, Development and Delivery</li> </ul>	<ul style="list-style-type: none"> <li>Low-income groups</li> <li>People living with a disability</li> <li>Women and girls</li> <li>Bus Rapid Transit (BRT) system users</li> </ul>
<b>Regional Communications Infrastructure Program (RCIP), Malawi</b>	<ul style="list-style-type: none"> <li>2. Governance and Capacity Building</li> <li>3. Policy, Regulation and Standards</li> </ul>	<ul style="list-style-type: none"> <li>Low-income groups</li> <li>District Information Offices</li> <li>Secondary schools</li> <li>Teacher Development Centres and Technical Colleges</li> </ul>
<b>Water Sector Trust Fund, Kenya</b>	<ul style="list-style-type: none"> <li>1. Stakeholder Identification, Engagement and Empowerment</li> <li>6. Affordability and Optimising Finance</li> </ul>	<ul style="list-style-type: none"> <li>Women and girls</li> <li>Youth</li> <li>Water users' associations</li> <li>Communities without access to improved water resources</li> </ul>
<b>Mi Teleférico Cable Car, Bolivia</b>	<ul style="list-style-type: none"> <li>1. Stakeholder Identification, Engagement and Empowerment</li> <li>5. Private Sector Roles and Participation</li> <li>6. Affordability and Optimising Finance</li> </ul>	<ul style="list-style-type: none"> <li>Low-income groups</li> <li>Women and girls</li> <li>People living with a disability</li> <li>All cable car users and employees</li> </ul>
<b>TransMilenio Bus Rapid Transit, Colombia</b>	<ul style="list-style-type: none"> <li>1. Stakeholder Identification, Engagement and Empowerment</li> <li>2. Governance and Capacity Building</li> <li>3. Policy, Regulation and Standards</li> <li>5. Private Sector Roles and Participation</li> </ul>	<ul style="list-style-type: none"> <li>Women and girls</li> <li>People living with a disability</li> <li>Informal vendors</li> <li>People facing homelessness</li> <li>BRT employees</li> <li>BRT users</li> </ul>
<b>Cairo Metro, Egypt</b>	<ul style="list-style-type: none"> <li>1. Stakeholder Identification, Engagement and Empowerment</li> <li>2. Governance and Capacity Building</li> </ul>	<ul style="list-style-type: none"> <li>Low-income groups</li> <li>Youth (in both urban and rural areas)</li> </ul>
<b>Last Mile Connectivity Program, Kenya</b>	<ul style="list-style-type: none"> <li>1. Stakeholder Identification, Engagement and Empowerment</li> <li>3. Policy, Regulation and Standards</li> <li>6. Affordability and Optimising Finance</li> </ul>	<ul style="list-style-type: none"> <li>Low-income groups</li> <li>People living in informal settlements and isolated communities</li> <li>Communities without electricity access</li> </ul>