Procurement legislation should include the following measures for greater ease of understanding and transparency: commitments to public announcements of tenders; standard or model contracting agreements; procurement appeal provisions; and objective eligibility requirements and evaluation criteria. Clear and consistent rules for transparent bidding and tendering procedures should be established, so as to guide the choice among different forms of public, private, and hybrid provision of infrastructure services. This includes consideration of VFM, financial sustainability, and risk analysis among others. Other good practices include a prescribed timetable for the duration of the procurement process, differentiated according to national bidding, international bidding, and restricted bidding; clear procurement appeal procedures; and a well-defined list of information which must be provided to all bidders and to the broader public.

A number of developing countries, including several that have been the subject of OECD reviews based on the PFI, have been implementing electronic procurement systems ("E-Procurement") to improve transparency and reduce corruption, notably by conducting transactions between awarding authorities and suppliers over the Internet. E-Procurement covers every stage of purchasing, from the initial identification of a requirement, through the tendering process, to the payment and potentially contract management. Developing countries recently introducing such systems include Colombia, Malaysia, Mauritius, Kenya, and the State of Andhra Pradesh in India.

Simplifying procurement procedures can also help cut 'red tape', accelerate the process, and especially facilitate participation by small-scale bidders. To encourage renewable energy investment, Jordan has for instance simplified its procurement process by allowing domestic and international companies to submit unsolicited proposals for renewable energy projects directly to the Ministry of Energy, instead of through a regular bidding process. In addition, residential and commercial establishments that have installed renewable energy facilities on their premises are allowed to sell any excess electricity to the national utility even without following a procurement procedure, thereby offering a strong incentive for clean energy use at small-scale (Jordan 2013). Nevertheless it is important to ensure that simplification does not 'cut corners' and come at the cost of due diligence and careful upstream contract selection. The many infrastructure PPP projects in Spain which were awarded on a mere 'least-cost' basis rather than based on adequate risk analysis, suffered considerably from such over-simplification in second half of the 2000's (Foster, 2011).

4.3. SOE governance and competition in infrastructure markets

Beyond FDI restrictions and procurement procedures, the regime for corporate governance of state-owned enterprises (SOEs), as well as the competition regime, can both significantly influence how much space is left for private investment in infrastructure markets. In many economies SOEs still represent a non-trivial share of the productive economy: on average across OECD countries for example, SOEs account for 2.5% of national dependent employment. SOE employment share exceeds 6% in Norway, France and Slovenia. SOEs are also often present in crucial segments of the economy, with 50% of SOEs from OECD countries by value operating in network industries (electricity and gas, telecommunications and other utilities, and transportation). These shares are even higher in most developing countries. The governance of SOEs is thus critical to ensure their positive contribution to the overall economic efficiency and competitiveness of the country.

SOE efficiency and good governance vary across countries. While in some countries the cost of subsidies and other forms of financial support to these companies is not excessive (Botswana's SOE in telecoms is for instance profitable), in others this exerts a considerable drain on the public purse (Tanzania has thus repeatedly bailed out loss-making SOEs). The dominant position of SOEs can also create market distortions, with an impact on the potential for private participation: in Myanmar SOEs enjoy a lower cost structure as they benefit from preferential access to finance in the domestic financial market, preferential

land allocation, low utility prices, low-interest loans, and easy licensing processes. Yet the majority of SOEs are not commercially viable because they are often inefficiently operated. Their recurring financial losses worsen national budget deficits, increase their debt levels and result in a shortage of funds for business expansion (Myanmar 2014). Ineffective SOE management can also result in poor infrastructure maintenance, service quality and network coverage – which in itself can also deter private participation. Following some basic corporate governance principles, including the same accounting and auditing standards as for listed companies (see Box 4.1), can help tackle these issues by pushing SOEs to raise their standards of accountability and transparency.

SOEs should not be exempt from the application of general laws and regulations, including high quality accounting and auditing standards. They should also have flexibility in adjusting their capital structure, and face competitive conditions regarding access to finance. Mauritius provides a good example in this regard. Functional separation[4] can help to identify in which areas profits or losses are made, and can therefore shed light on what operations the SOE is best-suited to shoulder, as opposed to the functions that would be best left to private actors. If well-managed, enhanced functional separation can help SOEs to better focus their staff and resources on delivering higher value-for-money and quality infrastructure services to the general population. Functional separation and the associated efficiency gains can also better prepare SOEs for potential competition once infrastructure sectors are liberalised, and can pave the way for privatisation in functions deemed better-suited for private sector provision.

Box 4.1. Principles for sound corporate governance of SOEs

A good corporate governance framework includes high levels of transparency and disclosure and well-defined shareholder rights. The OECD Corporate Affairs Committee has developed a set of principles for the corporate governance of SOEs, which include the following:

- SOEs should develop efficient internal audit procedures and be subject to an annual independent external audit based on international standards.
- Adequate disclosure of material information is also important to foster accountability, in particular relating to any financial assistance received from the state, commitments made on behalf of the state and any material transactions with related entities. Such transactions are often an important source of an uneven playing field for investors, particularly in weak institutional environments.
- Publishing annually an aggregate report on SOEs, focusing on their financial performance and their valuation, and giving an overview of their evolution also helps to ensure public accountability of SOEs. Secondly, the ownership function of the state has a strong influence on the overall investment environment. The involvement of the state in SOEs needs to be clearly separated from other state functions, including regulatory oversight, to help ensure a level playing field for all investors, especially with regards to complying with laws and regulations.
- The state, while being an active and informed owner, should not interfere in the day-to-day management of SOEs, leaving their boards with full operational autonomy to realise their defined objectives and fulfil their function of strategic guidance and monitoring of management. Board members should be nominated through transparent processes, based on competencies and experience and should act in the best interest of the company as a whole, rather than as

[4] "Functional separation", carried out within formerly vertically integrated industries often managed by SOEs, should not be confused with "structural separation" which divides a formerly integrated infrastructure company into competitive and non-competitive parts, thus making more space for private participation in one or more segment.

representatives of the constituencies that appointed them.

- SOE boards should be independent to be able to protect minority shareholders. In particular, the government should prevent SOE managers during the privatisation process from becoming incentivised by third parties, especially where new owners are identified prior to transfer of control.

Source: OECD Corporate Affairs Committee

Alongside infrastructure sector regulators, competition authorities can play a role in guiding the process of structural separation in infrastructure networks (see Section 6). Countries must decide whether such separation can be imposed by regulators to improve the existing market structure (even in the absence of an infringement of competition law), or whether it can be imposed by the Competition Authority only as a remedy for competition violations. In the latter case, structural separation needs to be enshrined within the competition law itself. Countries have different approaches to this question. While divestiture, which would include structural separation, is not available as a remedy under the 'abuse of dominance provisions' in Australian law, in Chile the Antitrust Commission can impose structural separation as a remedy if it finds that there has been a violation of competition rules.

More generally, competition authorities can help creating a more level playing field between SOEs and private actors if their advocacy is taken into consideration at the adequate political level. They can for instance denounce abuse of dominant market position by SOEs, as well as disproportionate subsidisation by Government; and can also help ensure that privatisation processes are adequately carried out (for instance that private bidders are not offered market exclusivity clauses – see Section 5.1). To play this role effectively, competition authorities require adequate political support and independence, in particular when they must challenge vested interests in utility markets. Mauritius is a strong performer in this regard, as two competition cases launched since 2009 involved Air Mauritius and Mauritius Telecom, both of them SOEs (Mauritius 2013).

4.4. Key policy take-aways

- The benefits of private sector participation in infrastructure are enhanced by efforts to create a competitive environment, including by subjecting activities (including those undertaken by SOEs) to appropriate commercial pressures, dismantling unnecessary barriers to entry and implementing and enforcing adequate competition laws.

- If they exist, preference margins for domestic versus foreign bidders in infrastructure procurement contracts should be made public and their impact on business linkage creation should be regularly assessed; in the interest of safeguarding infrastructure quality, these margins should also be calibrated according to project size and to the specificities of infrastructure sectors (including technical complexity).

- Preference margins to encourage SME participation in infrastructure contracts should be accompanied by supply-side efforts to increase SME productive capacity. SME financing schemes can also be used to promote greater involvement of domestic suppliers in infrastructure projects.

- Procurement legislation should be amended or updated to include measures for greater transparency in procurement contracts agreed between SOEs and private bidders. These measures can include: public announcements of tenders; standard contracting agreements; procurement appeal provisions; and objective eligibility requirements. Electronic procurement systems (E-Procurement) can also help improve transparency and reduce opportunities for bid-rigging.

- Principles and procedures for choosing between procurement methods (PPP/concession vs. traditional infrastructure procurement) should rely on value-for-money (VFM) principles and the process should be made public. Presenting these procedures in a user-friendly manner for public authorities, for instance in a public procurement or PPP manual, can be a useful step towards increased legibility and VFM.

- Corporatising SOEs can produce efficiency gains in their operations and is usually a necessary step in a privatisation or divestiture process. Moreover SOEs should generally not be exempt from the application of general laws and regulations, including high quality accounting and auditing standards, such as International financial Reporting Standards (IFRS).

- National codes of corporate governance can have a chapter/section (or a separate code) dedicated to corporate governance of SOEs. This can draw on international best practices as reflected in the OECD *Principles of Corporate Governance*, and, more specifically, on the *Guidelines of Corporate Governance of SOEs*. In such codes the commercial activities and their social/developmental activities of SOEs should be clearly distinguished.

5. PRIVATISATION, RESTRUCTURATION, AND STRUCTURAL SEPARATION OF INFRASTRUCTURE NETWORKS

At an early stage of economic development most countries' infrastructure networks tend to be vertically integrated industries managed by SOEs. In the 1980's privatisation and divestiture was widely considered as a means of improving efficiency in these networks. More recently, unbundling these networks – structural separation, which retains public participation in certain segments of the network industry – has become increasingly popular. It is considered to be a major facilitator of competition and private participation in infrastructure. However both privatisation and structural separation are complex undertakings that require careful cost-benefit analysis and supportive institutional structures. This section considers country experiences firstly as concerns privatisation and restructuration, and secondly as concerns structural separation.

5.1 Privatisation and restructuration experiences

Elements of natural monopoly throughout infrastructure sectors make it difficult to establish conditions for effective competition. Authorities achieve the best results by exposing as many activities as possible to competitive pressures, while subjecting areas of monopoly or scant competition to regulation in the public interest. An internationally open investment environment may facilitate competition, and enhance its benefits, by widening the number of potential participants and broadening the "relevant market" beyond national borders.

The broad legal framework bearing on SOEs should provide for a periodic reassessment of whether companies eligible for privatisation are better operated under public or private ownership; it should also

establish in a transparent manner which entities are authorised to make privatisation decisions. As Section 3 highlighted, dedicated agencies for privatisation and restructuration of SOEs exist in several countries (such as Botswana's Public Enterprise Evaluation and Privatisation Authority, PEEPA; Nigeria's Bureau of Public Enterprises; Tanzania's CHC; or Tunisia's CAREP). However, frequently these agencies play a weak role in overseeing the performance of the privatised entities ex-post; and they rarely have significant clout in pushing the privatisation or divestiture efforts ex-ante.

It is nonetheless critical that SOEs selected for privatisation be put on a corporate footing prior to the sell-off, with due consideration to the corporate governance framework in which these enterprises will operate following the transfer to the private sector (see Box 5.1). The rationale behind each privatisation should be transparently communicated to the public, with supervision by an auditing body that is well-resourced and independent from the executive. In China, due to weak safeguards for transparency, the first round of privatisation in the 1980s led to excessive dividend distribution and insufficient investment; and a subsequent round in the mid-1990s concentrated share-holding in the hands of former managers and key employees to ensure insider control (China 2003).

The case of Zambia illustrates some of the difficulties encountered in establishing effective SOE governance regimes. As a result of the privatisation programme, over 260 SOEs have been privatised since the early nineties. A few SOEs remain in the energy, building, finance and insurance services. However, in the absence of a co-ordinating central ownership unit, most SOEs are supervised by their line ministries, who also have regulatory and executive responsibilities in the SOEs' areas of operation. Although in all SOEs and statutory corporations the government has relinquished management control to appointed boards of directors, there therefore remains a conflict of interest and board independence is limited. While in principle SOEs do not enjoy preferential treatment by virtue of government ownership, they do obtain protection where they are not able to compete or face adverse market conditions.

In Viet Nam SOE reform and privatisation has been underway for nearly 30 years. There were about 12 300 SOEs at the beginning of *Doi Moi*. Initial reform measures in the late 1980's sought to dissolve unprofitable SOEs and reorganise others through merger and consolidation; profit-based accounting was introduced and output targets were replaced with profit targets; this was followed by a corporatisation programme beginning in 1992, which has slowly improved efficiency. By the end of 2007, over 33 00 SOEs had been corporatised, 200 of which are listed in the stock market (Viet Nam 2009). Morocco, in turn, has progressed towards better SOE governance by turning selected public establishments into limited corporations as a first step, and strengthening State financial oversight of these enterprises as a second step. The functioning of SOE boards of directors has also been enhanced, by separating and clarifying the functions of the board president and director general, as well as reinforcing shareholder rights.

Competition authorities should be closely involved in the corporatisation of SOEs. Indeed a concern of governments and competition authorities has been to avoid replacing public monopolies with private ones. This challenge has sometimes been exacerbated by the pursuit of conflicting objectives, in particular the desire to create more efficient industry structures, on the one hand, and the desire to sell state-owned assets at the highest possible prices, on the other. The latter has sometimes led governments to grant market exclusivity to foreign investors, a non-transparent incentive to FDI and a restraint on the degree of competition. Reconciling competing interests between political elites, the temptation to use SOEs as a source of political patronage, and the general interest is often a delicate balancing act. For these reasons a competitive bidding process should be conducted when privatising enterprises, and competition authorities should play an active role in the process – although this is not always the case in the practice.

5.2 *Experiences in structural separation*

Based on the experiences of structural separation in four regulated industries (gas, electricity, telecommunications and rail) across 34 OECD member countries, the OECD Competition Committee has argued that any policy-driven separation needs to be justified by a thorough cost-benefit analysis. As emphasised by the *OECD Recommendations Concerning Structural Separation in Regulated Industries* (2001), determining whether and what form of separation is appropriate in a particular sector must take into account several factors: the presence of economies of scale and scope; the rate of technological innovation in the sector; the effectiveness of other forms of regulatory intervention; the possible trade-off between competition and efficiency (related to vertically integrated firms' ability to better maximise profits along the production chain); and the likely impact on investor confidence and thus on levels of investment.

As a first step toward further unbundling of integrated network industries, countries wishing to encourage private participation in infrastructure have also revised their sector regulation to remove the monopoly status of utilities in infrastructure sectors such as energy and water. It has meant increasing the allowable percentage of private participation, and in some cases removing restrictions to foreign ownership altogether (see Section 4.1). In Indonesia, state monopolies have thus been eliminated in telecommunications over the past decade and currently also in the operations of major ports. Increased private participation is possible in toll roads, railroads and power generation. Where SOEs still operate, efforts are under way to ensure that they do so on commercial principles, under an independent regulatory authority (Indonesia 2010).

In the power sector, a first step towards the establishment of a competitive electricity market is often the shift from a fully vertically integrated monopoly to that of a 'single-buyer-model' whereby independent power producers (IPPs) contract with a national utility. However this model should be used with care: if poorly implemented it can lead to substantial losses to the public purse, as government is expected to step in if the "single-buyer" (or state-owned transmission and distribution company) cannot honour its obligations to the independent generators. In 2006 the Tanzanian state-owned 'single-buyer' TANESCO was paying more than 50% of its revenue to the country's two IPPs, in the form of fuel and capacity charges. The latter alone were equivalent to 1% of GDP, obliging the government to step in and cover some of these costs for TANESCO (Eberhard et. al., 2006). Conversely in India in 2009, some IPPs in states that had surplus production had to sell their output at lower prices to the state-owned buyer – who in turn sold it at a premium to consumers in other states. Table 5.1 on the following pages identifies further trends for structural separation across different infrastructure sectors and countries, together with the risks and opportunities entailed.

5.3 *Key policy take-aways*

- Encouraging private participation in various infrastructure sectors can be facilitated by increasing the allowable percentage of private participation (including foreign) in those sectors. Sectoral restrictions on foreign direct investment, in particular, should be clearly set out and delineated in an easily accessible document, such as a "negative list" that groups all such restrictions.

- FDI restrictions should be justified based on well-defined social or economic objectives, and should be reviewed on a regular basis with a view to rationalising them. Rather than excluding foreign participation outright, such participation in infrastructure sub-sectors could be accompanied by business linkage and training programmes.

- Unbundling of infrastructure markets can increase the menu of options for private investors and thus facilitate their greater participation in infrastructure. This should be done with due attention

to the possible risks involved: in the power sector, proper due diligence and evaluation of needs should be undertaken when using the single buyer model, so as to prevent high fiscal costs for the government.

- National competition authorities should have the capacity to weigh the costs and benefits of structural separation of infrastructure markets, and should have the mandate and political backing to perform a policy advisory role in infrastructure privatisation and divestiture processes.

- Countries should have a dedicated national authority for oversight of privatisation procedures and/or of all public enterprises. This should include responsibilities for supervising the performance of formerly public enterprises in the first years following their privatisation.

Table 5.1: Trends of structural separation in infrastructure networks across selected developing and emerging economies

Sector	Nature of structural separation	Enabling legal framework: country example
ICT	Unbundling can involve separating regional and national trunk line operators from service providers responsible for wiring households and businesses to the network. In mobile telephony, construction and operation of transmission towers can be separated from services provided directly to users. Participation by the private sector is more frequent and involves more stages in the value chain in the ICT sector because incumbent SOEs have often been slow to take up the new mobile ICT technologies.	In the telecommunications sub-sector in Costa Rica, the new legislation includes regulatory principles such as universal service, independence of the regulatory authority, transparency, interconnection, and fair competition. It opens markets to competition in three sub-sectors: mobile services, internet services, and private networks (Costa Rica 2013). In Myanmar the new Telecommunications Law, enacted in October 2013, opened mobile telecommunication to private investment, including foreign, and foresees the establishment of an independent regulator. In early November, the government issued a first draft of the Proposed Rules for Telecommunications Sector for consultation. This contains only a first set of implementing rules and procedures on which the Ministry is seeking consultation, notably on licensing, access and interconnection, spectrum management, numbering and competition. These are mostly in conformity with international standards and are expected to promote competition and facilitate the roll-out of telecom network. The proposed rules adopt a multi-service licensing framework and technology-and-service neutral rules; establish cost-oriented interconnection and access price regulation; and adopt a liberalised and competitive spectrum management framework, among others (Myanmar 2014).
Energy	In the electricity subsector generation of power can be separated from its transmission through a high voltage grid, and from the subsequent distribution to households within a given catchment area by local wiring, and provision of other services such as billing, fee collection, and customer service. In the gas sub-sector production can be separated from storage of liquefied natural gas in tanks, transmission via pipeline, and distribution to customers through local networks of pipes. As in the case of electricity, distributors are also responsible for billing, collection of	The government of Mozambique initiated reforms in the electricity sector in 1997, which opened the generation and transmission market to private enterprises, and created the National Electricity Advisory Council (CNELEC) to set energy policy and provide advisory services. In Myanmar private participation is discouraged by low electricity prices averaging USD 0.05/kWh. The costs of electricity production from gas and diesel were recently estimated to lie between USD 0.09 and USD 0.35 per kWh. Currently, there is no standardised price setting system for electricity and natural gas, and the purchase price for electricity is re-negotiated on an annual basis without appropriate mechanisms. The government is aware of the need to establish an adequate pricing mechanism and announced plans in December 2012 to implement such a system in accordance with international practices. It also plans to revise tariffs upwards to stimulate investment, but this may prove difficult due to the

	fees, and customer service. The volume of private sector investment in the power sector is concentrated in the generation stage (independent power producers) with a SOE as the single buyer; transmission and distribution has tended to remain with SOEs because of the political power of the incumbent firms, and difficulties in securing adequate cost recovery from tariff reform.	unpopularity of such measure (Myanmar 2014). In Nigeria the *2005 Electric Power Sector Reform (EPSR) Act* was intended to end Federal Government monopoly in the power sector, and to facilitate the unbundling of generation and distribution functions within the electricity industry. The government intends to retain control of transmission and has obtained several loans from foreign partners to help improve transmission nationwide. On 30 September 2013 the share certificates of 15 state-run electricity distribution and generation companies were handed over to consortiums of domestic and foreign investors. There are three main electricity utilities in Malaysia. Tenaga Nasional Berhad (TNB) is the biggest utility and supplies peninsular Malaysia while Sarawak Electricity Supply Company and Sabah Electricity Limited (80% owned by TNB) supply Sarawak and Sabah respectively. The electricity sector has been open to independent power producers since 1994. IPPs negotiate power purchasing agreements with TNB, which owns and controls the national grid.
Transport	In highways, unbundling is usually done by treating some road segments differently from others. For example, toll roads can be built and freight operators required to use them, with provision for local residents to continue to use parallel secondary roads. In railroads, there are numerous possibilities. Freight services can be separated from passengers services, trunk lines can be separated from the rail segment connecting the truck line to subsidiary routes. In maritime ports and airports, ownership can be separated from management. Different operating companies can be established to provide these different services. Road transport projects have begun to replace telecoms as the second highest volume investment; these involve two different types of projects: construction of limited access motorways with cost recovery from tolls, and rehabilitation and management contracts for existing roads. In the ports sub-sector, the transition from a public service port structure (where all services required for the functioning of the seaport system – including maintenance and cargo handling – are offered by the port authority) to a landlord port structure (whereby the public port authority acts as an independent regulatory body and landlord, while private companies carry out port operations such as cargo handling) can make more	In Mozambique, private sector participation is more prevalent in transport than in other sub-sectors with some notable successes, such as the Maputo Corridor, a cross-border PPP. Private sector participation is welcome in railway construction, rehabilitation, operations and management; and in road, rail and port facilities in the form of concessions. In Nigeria, reforms in 2004 and 2007 broke new ground by establishing an enabling framework for PPP infrastructure projects in Lagos State. It notably formalised the role of the "State Roads, Bridges and Highway Infrastructure PSP Development Board" as a regulatory authority to oversee concessions and other PPP infrastructure projects in the State's roads sector, and provided a model for future legislation and regulation across the State's other infrastructure markets. In 2005, Morocco launched a programme of progressive liberalisation in several key sectors, notably rail transport and maritime port activities. This process involved, first, separating the regulatory from the operating function; then transforming public enterprises into corporations (sociétés anonymes) so they could operate on an equal footing with private competitors. In Indonesia the 2008 Shipping Law provides the foundation for a comprehensive reform of the Indonesian port system. Most notably the law removes the legislated state-sector monopoly on ports and allows private sector participation. This is expected to introduce competition in port services, which could put downward pressure on prices and improve the quality of port services. Private firms will eventually be allowed to operate the 111 main ports under the control of the state-owned ports operator. Also in Indonesia the government enacted a new Railway Law in 2007, which established a new state-owned company to manage the rail track separately from the state-owned railway company PT Kereta Api (PT KA), which should allow for greater scope for private participation and eventually for privatisation of PT KA. In Tanzania following a transition toward a landlord port structure, management of the Dar es Salaam Port container terminal has been leased to a private company with major improvement in

	space for private participation.	performance as a result (Tanzania 2013).
Water and Sanitation	Substantial progress has been made in unbundling water and sanitation networks. Market segments include the following: potable water treatment plants with or without sewage treatment; sewage collection with or without treatment; sewage treatment plants; water transfer systems; water utilities (multiple plants) with or without sewerage. Yet private participation in water and sanitation has been disappointing, despite the large needs gap and often due to difficulties in cost-recovery. In many countries the role of private investors has been reduced to that of independent service providers in facilities management.	In recent years, water management in Brazil has become increasingly centralised and investments in the sector have fallen off due to insufficient cost recovery. A number of foreign enterprises have exited the sector. A handful of smaller systems are under private management through leases. Nonetheless, by increasing private sector participation and competition, the water sector has realised significant improvements in operational efficiency.

6. REGULATION AND PRICE SETTING IN INFRASTRUCTURE MARKETS

6.1. Price-setting for infrastructure markets

Based on World Bank research, the low level of cost recovery through tariffs in the water and energy sectors is problematic for countries at all levels of development and in all regions. According to a recent study, no sample country in South Asia or in Sub-Saharan Africa attempts any cost recovery of capital expenditures in these sectors. Only 10% of the poorest countries manage to recover at least some costs of operation and maintenance. In Sub-Saharan Africa, the recovery rate for electricity and water was 75% and 64%, respectively. OECD work on water governance in MENA countries identifies that revenues in the water sector systematically fail to match increases in operating and capital costs because tariffs have remained low, undermining the ability of operators to meet their costs (OECD 2014).

Indeed price-setting and cost recovery challenges arise because basic utilities, especially water or electricity, are intentionally under-priced in the interest of end-user affordability. According to practitioners in the field, a rule of thumb is that the poor should not have to spend more than 15% of their income on infrastructure services (EIB, 2010). Yet in many developing countries target populations are simply too poor to be able to pay sufficient amounts to make private sector projects viable; and even where there might be 'willingness-to-pay' for the service in economic terms, political resistance to utility charges remains high. For such reasons no country in the world has to date developed its water sector through tariffs alone; rather, taxes, tariffs and transfers (or the "3Ts", as identified by the OECD Horizontal Water Programme) are the three ultimate financial sources of investment for the water sector. OECD work on water governance stresses that strategic financial planning is essential to find the right mix of these, so as to achieve service targets and leverage other sources of finance (OECD, 2009).

Among the "3Ts", tariffs play a particularly crucial role in achieving sustainable service provision, and keeping tariff levels artificially low for all is in fact likely to harm the poor (OECD, 2009). Where sector regulation has typically set prices below operating costs (at about 30% of total costs in the water sector for instance), there is little commercial incentive for expanding services. Tariffs that are held too low cannot guarantee a profitable revenue stream even in the long-term. They are detrimental from an environmental perspective as well, as user incentives for conservation of resources are weak. Moreover since tariff adjustments, when they are made, are often backward-looking, they seldom cover planned

investment costs nor adequately resolve the challenges of under-investment, poor maintenance, and future capacity bottlenecks.

Nigeria has for many years had one of the lowest retail tariffs in the world, which has hindered the growth of the sector. In addition to preventing cost-recovery by electricity providers, these low tariffs have deterred potential private investors, and have deprived the power sector of funds required to maintain and expand capacity. Partially as a result, this pricing policy has been accompanied by extremely unreliable electricity supply; therefore the seemingly low tariff in reality masks a real cost estimated to be ten times greater for the poorest Nigerians who resort to kerosene and firewood (Nigeria, 2014).

Artificially low tariffs backed by production subsidies for SOEs thus do not appear to be the most efficient way to broaden the access of poorer citizens to basic services. In fact, such subsidies do not automatically generate the expected socially desirable effects. In most cases they amount to a subsidy of the middle and upper classes, whose neighbourhoods are far more likely to be supplied with electricity and water than poorer ones. The risks are that the beneficiaries of the subsidies will resist reform efforts to reduce them, e.g., through targeting poor households, and perpetuate a situation of underinvestment and low private sector involvement in these sectors.

In view of these various risks and fiscal costs, an increasing number of countries are using cross-subsidies – such as incremental bloc tariffs for water and electricity, whereby larger users pay more than smaller ones. From a coverage standpoint, standard infrastructure tariffs can be set so that households in easily accessible areas subsidise remote communities, or differentiated pricing schemes can enable extended coverage. However OECD research on the water sector has shown that cross-subsidisation seldom works. Usually poorer families are larger, with the result that increasing block tariffs end up subsidising the richer (OECD, 2009). While such tariffs are can usefully support financial sustainability of utilities, as well as signal scarcity, they are not necessarily good at addressing social concerns. Using targeted direct subsidies or connection subsidies instead can allow SOEs to operate on a more commercial basis, by contrast to production subsidies. This can help level the playing field for private operators, and also allow public utilities to better mobilise adequate resources to sustain existing supply systems or invest in the rehabilitation and expansion of infrastructure.

As the caveats above indicate, such subsidisation mechanisms should generally be kept to a minimum on account of their market distorting effects and lack of transparency. Reforming subsidies is thought to have the potential for freeing up about 1% of GDP for additional infrastructure investment. Even when consumption rather than production subsidies are used, aggregate subsidies are estimated to reach about 0.7% of GDP (EIB, 2010). Accurate targeting of needy populations is also particularly difficult, as the example of Mozambique illustrates. The government of Mozambique laid out the retail electricity tariff methodology in 2003, making provisions for automatic annual adjustments to the average tariff baseline. The national energy utility EDM has four categories of tariffs: social, household, farming and a general tariff. However, as there are no regional variations, the same tariffs apply regardless of location. Moreover although the Electricity Law of 1977 put in place a "social tariff" at subsidised rates for low-income households, due to difficulties in qualifying for the tariff less than 1% of households have accessed it.

Infrastructure pricing frameworks must therefore be very carefully designed in order to facilitate private investment while benefiting end-users by ensuring that basic infrastructure services are affordable for all. This requires that the sector pricing policy accurately reflect the costs of infrastructure improvement. As discussed in the following section, infrastructure regulators can play a crucial role in setting tariffs in infrastructure markets, and in avoiding artificially low prices which can discourage private participation or fail to incentivise innovation on behalf of national infrastructure providers. In a number of countries and across several other sectors, dedicated funds have also been established to finance the universal service requirements that are imposed on private operators and that may impede cost-recovery.