

MINISTRY OF FOREIGN AFFAIRS OF DENMARK

Smart Liveable Cities in India - Opportunities for Danish Companies

Commissioned by the Royal Danish Embassy and prepared in
collaboration with Quercus Group



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DISCLAIMER

The Smart Liveable Cities in India report was prepared by Quercus Group and the Royal Danish Embassy in India based on knowledge and market insights acquired through desk research and dialogue with key stakeholders in Denmark and in India, between November 2015 and March 2016.

The scope of this report is limited to the *100 Smart Cities Mission* of the Ministry of Urban Development, Government of India. While other urban development schemes are mentioned, they remain outside the scope of this report.

Although care has been taken to ensure accuracy, completeness and reliability of the information provided, Quercus Group and the Royal Danish Embassy in India assume no legal liability for the information, opinions or representations in this report. Furthermore, the information provided in the report is subject to change without notice.

PREFACE

The establishment on January 2015 of NITI Aayog and Gol's adoption of the 14th Finance Commission's recommendations leading to a substantial increase in the States' share of central tax revenues bear witness to the accelerating devolution of powers from the Central Government to States and their concurrent financial empowerment.

In the autumn of 2015, and in view of this development, we at the Royal Danish Embassy in New Delhi prepared a state-centered engagement strategy. It was felt that Denmark and Danish companies have much to offer India with regard to its strategic challenges of water security, energy efficiency and environmental degradation. At the same time, the responsibility for carrying India's development forward in these areas increasingly lies with India's States.

As part of the strategy and given the need to focus our resources, we undertook a mapping of India's 29 States and Union Territories on the basis of urbanisation rates, GDP per capita, Danish corporate presence etc. Combined with our on-going dialogue with Danish companies this eventually helped us zoom in on a handful of States where we see a particular potential for expanding cooperation. The list is open-ended and nothing is carved in stone, and at the end of the day cooperation will very much depend on whether the interest in engagement of the Embassy and other Danish players is also felt by these States.

With its clear bottom-up approach, the 100 Smart Cities Programme lends itself as an attractive framework for approaching concrete Indian States and cities. Also, smart urban development is a platform, where Danish companies have a lot to offer. In November 2015, the Embassy formed a 'Smart Liveable Cities Alliance' with a number of Danish companies active in urban development and eager to explore opportunities in the 100 Smart Cities Programme.

To be able to provide answers to some of the questions that emerged, we decided to work out a report on the 100 Smart Cities Mission tailored to the needs of Danish companies. This is where our good cooperation with the co-authors of this report, Quercus Group, started.

Delivering on the Embassy's dialogue with Indian States and with funding from the East Asiatic Company Foundation, the Embassy commissioned Innovation Centre Denmark in India (ICDK) to undertake fact-finding missions to the cities of Udaipur, Erode and Kakinada, which are all part of the 100 Smart Cities programme. These fact-finding missions (main findings included in this report also) not only gave the Embassy valuable knowledge of local conditions and concrete opportunities for Danish companies, but also established a valuable network among Smart City officials at both state and city levels.

While thanking all those who have been involved in creating a Danish platform in India's 100 Smart Cities process, including in the drafting of this report, I wish you a pleasant reading.

Peter Taksøe-Jensen, Ambassador

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ABBREVIATIONS

100 SC	: 100 Smart Cities
A&OE	: Administrative and Office Expenses
ADB	: Asian Development Bank
AT&C	: Aggregate Technical and Commercial Losses
CII	: Confederation of Indian Industry
CSS	: Centrally Sponsored Scheme
DKK	: Danish Kroner
DPR	: Detailed Project Report
EPC	: Engineering Procurement and Construction
GoI	: Government of India
HPSC	: State Level High Powered Steering Committee
ICDK	: Innovation Centre Denmark
INR	: Indian Rupee
IT	: Information Technology
LCPD	: Litre per capita per day
MoU	: Memorandum of Understanding
MoUD	: Ministry of Urban Development
NRW	: Non-Revenue Water
PMC	: Project Management Consultants
PPP	: Public Private Partnership
QCBS	: Quality Cost Based System
SCP	: Smart City Proposals
SPV	: Special Purpose Vehicle
ULBs	: Urban Local Bodies
UTs	: Union Territories
WB	: World Bank



EXECUTIVE SUMMARY

With its urban population poised to increase by 400 million by 2050, India is facing a huge challenge in accommodating the expected growth of its cities. The point of departure is not ideal. On a large number of parameters, such as water, sanitation and power, India's cities are lagging behind cities of economically comparable countries.

With the introduction of a number of new urbanisation programmes, notably the 100 Smart Cities (100 SC) Mission, the Government of India (GoI) has put in place a new policy framework to empower States and Urban Local Bodies (ULBs) to commence on a much needed upgrading of its cities. The new framework offers a number of opportunities for Danish companies.

The Indian Central Government has committed INR 480 billion¹ to finance the Mission, a figure that is conditional to equal funding from the State Governments. This core funding of almost INR 1000 billion is however only conceived as seed money to allow cities to attract funds from other sources, including from development banks, bilateral donors and private investors.

¹The currency used in this report will be the Indian Rupee (INR). At the time of writing the exchange rate was 10 INR= 1 DKK

This report describes the present status of the 100 Smart Cities Mission, the key features and concepts of the Mission and its timeline. It gives an overview of the mechanisms of the programme and the stakeholders involved. Findings from missions carried out by the Royal Danish Embassy to three Smart Cities, including potential projects, are reflected in this report. Finally, this report attempts to provide practical answers as to how, when and where Danish companies can make their solutions relevant and how the Royal Danish Embassy can assist them.

The 100 SC programme can be overwhelming for companies wishing to grasp the opportunities arising from it. This report attempts to support Danish companies in their venture into the Indian market for smart cities by pointing to some viable entry points. In this context, Danish companies ought to consider:

- Building on existing relationships in India. The importance of leveraging established networks and access to stakeholders cannot be overemphasised;
- Partnering with local or other foreign companies with a local set-up and network;
- Mapping the 100 cities according to where they are in the 100 SC competition to ensure that the offered competencies match needs, including for either advisory or technology services;
- Promoting the economic sustainability and life cycle cost of the service or technology offered given the increased emphasis on the quality of solutions in India and in the 100 SC programme in particular;
- Setting up a pilot or demonstration project that can be scaled up or replicated when proven successful;
- Entering the market with a long term commitment.



INTRODUCTION

There is a strong case for a systematic review of the opportunities within urban development in India. India's present growth of more than 7% exceeds that of any other greater economy (G20)². Furthermore, its young and increasingly educated workforce represents a considerable growth potential.

An important element in India's growth outlook is its current urban transformation. India is yet to unlock the full growth potential of its urbanisation process and the existing urban infrastructure is not equipped to accommodate the coming dramatic growth of its cities. Addressing these issues is high on Gol's agenda.

The launch of 100 SC Mission in June 2015, together with other urbanisation-related programmes, exemplifies the more proactive approach, which the Gol is taking to get urbanisation right. These programmes emphasize 'bottom-up' processes, with individual plans being conceived locally at city-level and early citizens' hearings. This reflects the Gol's commitment not only to build inclusive and liveable cities but also to fulfil its vision of achieving more decentralised and collaborative decision-making.

² World Bank Data 2015a

The ongoing devolution of powers from the Central Government to the State Governments, and the concurrent financial empowerment of the urban local bodies, will open up for new and potentially strong clients at state and local levels.

The Royal Danish Embassy in India is expanding and strengthening its dialogue with selected Indian states and Danish players so as to contribute positively to India's urban transformation. The fact-finding missions to Udaipur, Erode and Kakinada, carried out by Innovation Centre Denmark in India, are a good example of this approach. Findings from these are presented in the chapter "Opportunities for Danish Companies".

The potential of India's urban development is abundant, and Danish companies hold strong competencies that can help unleash this potential. With India's strengthened commitment to its urban development, now is a good time for Danish companies to prioritise this market strategically.



Urbanisation In
India



The 100 Smart
Cities Mission



Opportunities
For Danish
Companies



Smart Liveable
Cities in India

URBANISATION IN INDIA

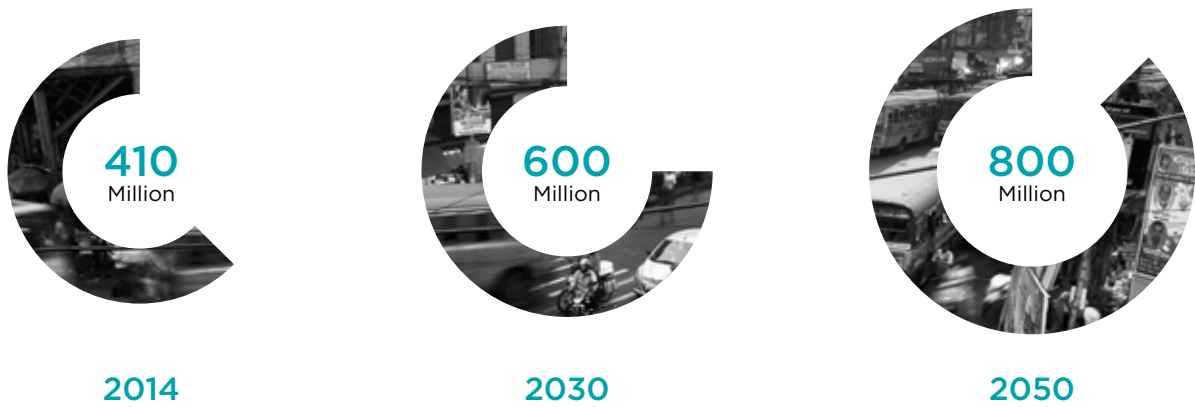




INTRODUCTION

India's transition from an agricultural economy to an industrial and service-based economy is in a crucial phase. Cities offer increasingly better opportunities in education, employment, income and lifestyle, and as a consequence India is witnessing rapid growth in its urban population.

BOX 1 FORECAST OF INDIA'S URBAN POPULATION



URBANISATION RATES

In 2014, 410 million people resided in India's cities, a figure that is expected to reach almost 600 million by 2030 and more than 800 million by 2050³. This corresponds to urbanisation rates of 40% in 2030 and 50% in 2050.

However, there are considerable differences in levels of urbanisation across the country. States like Bihar (10.5%) and Assam (13%) are among the least urbanised, whereas some of India's large states, including Tamil Nadu, Maharashtra and Kerala, already have urbanisation rates of close to 50%. By economic measures these states are also among the most developed, reinforcing the well-documented correlation between urbanisation and economic prosperity. However, the ability of urbanisation to deliver widespread improvements in both prosperity and liveability remains underexploited⁴.

BOX 2 DEFINING URBAN INDIA

India applies a rather conservative definition of urban areas, which has many areas in India registered as 'rural' although they visually appear to be urban. The triple criteria are

- A minimum population of 5,000;
- 75% or more of the male working population in non-agricultural occupations;
- A population density of at least 400 per sq km.

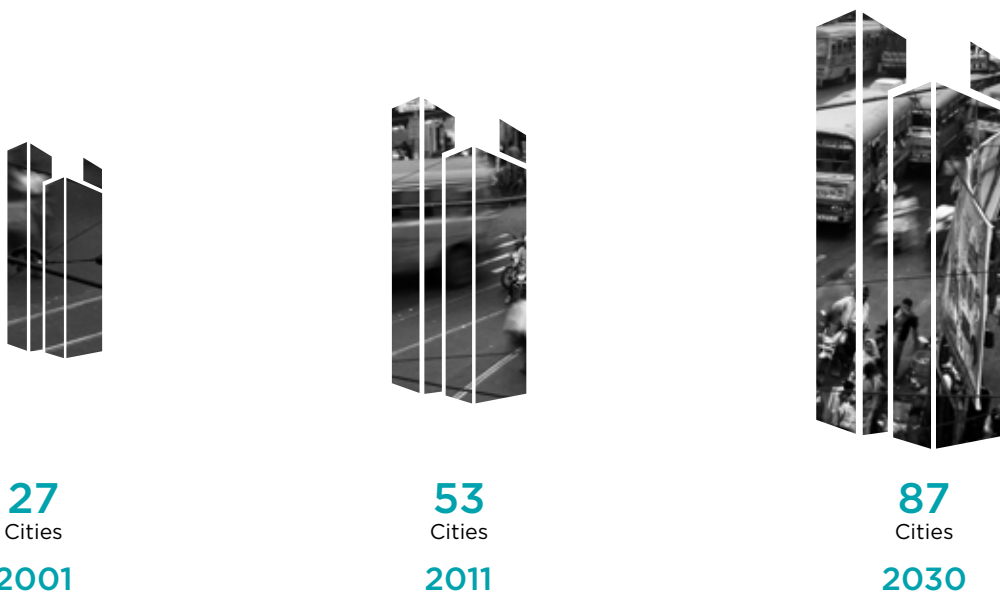
URBANISATION CHALLENGES

India's current urban infrastructure lags behind that of many economically comparable nations. This is generally attributed to weak urban planning, distorted land markets and a rigid regulatory framework for governing land use and management⁵. Issues related to governance and finance are key aspects holding back urban India.

³ UN 2014

⁴ 'Leveraging Urbanisation in South Asia', World Bank (2015)

⁵ World Bank 2013b

BOX 3 THE NUMBER OF CITIES WITH MORE THAN 1 MILLION PEOPLE


Governance

Historically weak governance, especially at the local level, is one of the main factors impairing urban India. At the bottom of the Indian administrative hierarchy are the Urban Local Bodies (ULBs) that comprise municipalities and city corporations. Since the 74th constitutional amendment of 1992, India has attempted to decentralise urban governance by vesting urban local bodies with status and powers⁶. However, the actual implementation varies greatly from state to state.

Still, ULBs are the key service providers to citizens. They are responsible for mobilising local resources (e.g. through land taxes and user charges), and for delivering services and maintaining the city's basic infrastructure. In reality, ULBs do not have adequate power, funds or capacity to provide these services.



⁶ The 74th Constitutional Amendment Act legally paved the way for local governance by adding a third layer to India's existing governance structure of central (federal) government and state governments (currently 29 states).

BOX 4 INDIA'S THREE-LAYERED GOVERNANCE STRUCTURE
Central Government - Core Ministries

- Ministry of Urban Development
- Ministry of Housing and Poverty Alleviation


State Government - Core Departments

- Municipal supervision
- Town planning
- Urban development


Local Government - Urban Local Bodies

- Development authorities
- City Corporation/Councils

Financial issues

A fundamental reason for weakness of the ULBs is their limited capacity to raise money through taxation or other government revenue schemes. Basic civic amenities are heavily subsidised and user charges are low (if not completely absent). This leaves few resources for improving and upgrading the city's infrastructure and service delivery: ULBs rely extensively on central and state funding for such activities.

One central aim of the 100 SC scheme is to strengthen the ULBs' capacity to generate funds themselves.

Urban service delivery

Establishing an institutional framework for well-functioning urban service delivery has proved challenging for India. This is true for waste management, water and sanitation services alike. Service delivery institutions typically have limited autonomy, accountability and incentives, and lack client orientation.

Coordination issues

The operational linkages between institutions at different levels of government (centre, state and local) are weak, if not absent, resulting in inefficient division of labour and sometimes duplication, thereby impeding daily operations⁷.

Slum

The problem is exacerbated by an increasing number of informal settlements (slums). It is widely recognised that if these issues are not adequately addressed, India's cities will become increasingly chaotic and difficult to manage. Furthermore, rural poverty will simply be converted to urban poverty, with little improvement in standards of living as the result⁸.

The Need for a New Approach

For these reasons, India faces severe deficiencies in basic urban infrastructure and services. The responsibility for financial management and delivery of basic services is fragmented across different agencies, which are often not held accountable and have few incentives and resources to collaborate and perform well. As observed by the Planning Commission, until now, urban planning in India has largely been limited to the provision of basic services to a chaotic urban sprawl. There has been a lack of a more integrated approach to modern-day urban requirements⁹.

However, the urban agenda is changing and the GoI is displaying a willingness to address many of these deficiencies. The launch of the 100 SC and other schemes reflect a new sense of urgency to gear Indian cities for the challenges of mass urbanisation and attract the necessary investments¹⁰. The 100 SC initiative attempts to overcome many of the present shortcomings and has instilled a new sense of optimism in cities. It has also generated genuine interest among decision-makers in finding solutions that can substantially improve the functioning of their city and the quality of life of its citizens.

⁷ World Bank, 2013a

⁸ Planning Commission 2013a and 2013b

⁹ Planning Commission 2013a

¹⁰ Refer to page 41 for GoI's current urbanisation-related schemes



BOX 5 KEY INDICATORS OF URBAN SERVICE DELIVERY**URBAN WATER SUPPLY**

- Per capita supply of water in Indian cities ranges from 37 lcpd to 298 lcpd.
- The average duration of water supply in urban areas is 1-6 hours per day.
- 47% of households have individual water connections.
- 50% of water demand will remain unfulfilled according to 2030 business-as-usual projections.
- 20% of this gap can be bridged by augmenting available water supply. The remaining deficit can only be closed through greater water use efficiency.

**SANITATION**

- No Indian city has a sewerage system that covers the entire city population.
- 4,861 towns and cities in India lack even partial sewerage networks.
- 37% of urban households are connected to open drainage, while 18% are entirely unconnected.
- Raw sewage often overflows into open drains.
- Only 30% of the human waste generated in Indian cities can be treated by current infrastructure.
- 18% of urban households have no access to any form of toilet facilities: open defecation is a serious issue in Indian cities.
- Less than 20% of the road network is covered by storm water drains.



AFFORDABLE HOUSING

- 94.9 million slum dwellers in Indian cities in 2012.
- 18.8 million urban housing units needed.
- 38 million urban housing units needed by 2030.



PUBLIC TRANSPORTATION

- Only 27% of urban transport needs in India are covered by public transport.
- 20 out of 85 Indian cities with populations above 0.5 million offered bus services in 2009.
- Only 1.1% of transport on Indian roads is today public transport; down from 11% in 1951.



WASTE

- Solid waste management is inefficient and ineffective, due largely to the absence of a sustainable business model covering the full spectrum of waste management activities.
- Waste collection coverage ranges from 70% to 90% in major metropolitan cities, but is less than 50% in smaller cities.
- Less than 30% of solid waste is segregated.
- Collected waste is rarely disposed of in a controlled, hygienic and environmentally sensitive way.

Smart Liveable
Cities in India

THE 100 SMART CITIES MISSION





SMART CITY IN AN INDIAN CONTEXT

The 100 SC Mission is a programme promoting urban development in India through the application of smart solutions. ‘Smartness’ is generally associated with hi-tech and IT-based solutions, but in the context of India the definition focuses on establishing more efficient core infrastructure related to water, electricity, sanitation, transportation and waste management. There is a strong focus on building inclusive cities that enhance living standards and employment opportunities. Initiated in June 2015, the 100 SC Mission has a five-year mandate, and - with the equal commitment of Gol and State Governments - commands an operating budget of approximately INR 960 billion. It is a bold initiative that marks a clear shift away from business as usual in India’s urban development.

BOX 6 MAIN FEATURES OF THE 100 SC MISSION

i. A performance-based programme: The money flowing from the 100 SC Programme is not a passive entitlement: cities will have to compete for funds. Funds will be distributed to the cities on the basis of assessments made on specific scoring criteria

ii. A bottom-up approach: Citizen hearings are required to ensure active citizen involvement

iii. Transparent: The Smart Cities’ template and the common criteria that cities must use - including the extensive use of the digital and social media platforms for information sharing and engagement - provide a degree of transparency rarely displayed in India

There is no universally accepted definition of a smart city. Even in India, ‘smart’ has different connotations depending on individual city contexts. No fixed or narrow definition for the development of India’s smart cities has been created. However, a range of general requirements to provide for the needs and aspirations of individual cities and their dwellers have been defined. The idea is to look at compact areas in which to create a replicable model that will act as a lighthouse to other aspiring cities all over India.

A central point of the 100 SC process is to leave room for experimenting. While the parallel AMRUT programme¹¹ can be seen as the ‘nuts and bolts’ of India’s new urban development framework, the smart cities, are the ‘laboratories’ where the procedures and solutions that give the best results in an Indian context can be identified and replicated elsewhere.

¹¹ Refer to page 41, for a description of the AMRUT programme



THE OVERALL MISSION PLAN AND STATUS

The overall 100 SC Mission has been designed as a competitive process running over a period of five years. The mission was launched in June 2015 and the names of the cities shortlisted by the states were made public in August 2015. The shortlisting was made on the basis of standardised criteria, such as the cities' track records in completing a number of already defined urban development goals. 100 (97)¹² cities were chosen and each state was guaranteed at least one city in the competition.

Only shortlisted cities can compete for funds in the 100 SC Mission. The competition will run over a number of rounds in 2015-16, 2016-17 and 2017-18. Each of the 100 cities will develop a Smart City Proposal (SCP), which will be assessed by MoUD. Those not chosen for funding in one round can adapt or adjust their SCP for the next round.

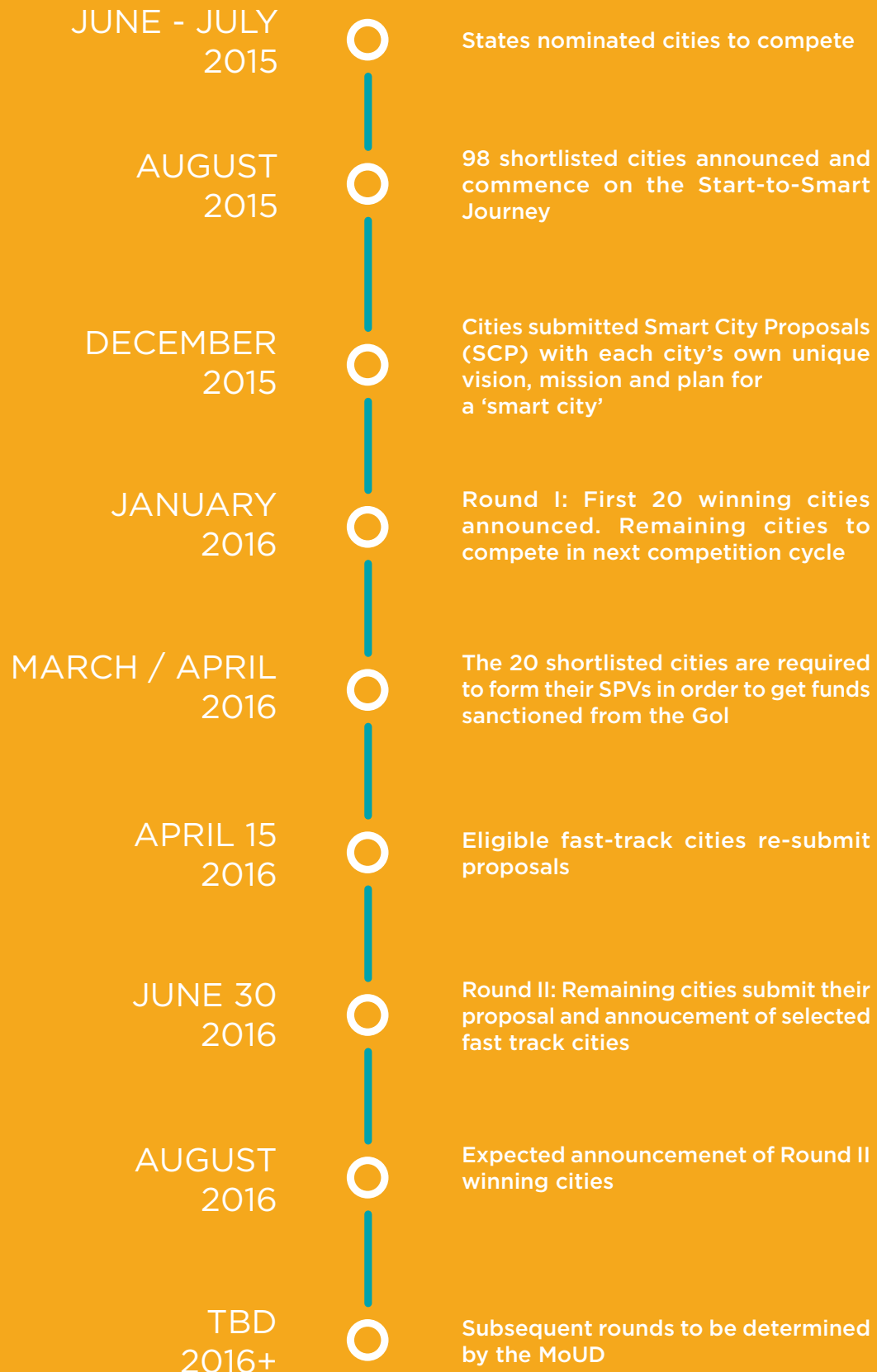
Round I

In December 2015, 97 candidate cities submitted their SCPs containing the overall vision for the city's development and the main actions to be made in this regard. On the basis of a subsequent scoring and ranking by MoUD's expert panel, the top 20 cities were selected for funding for the financial year 2015-2016¹³.

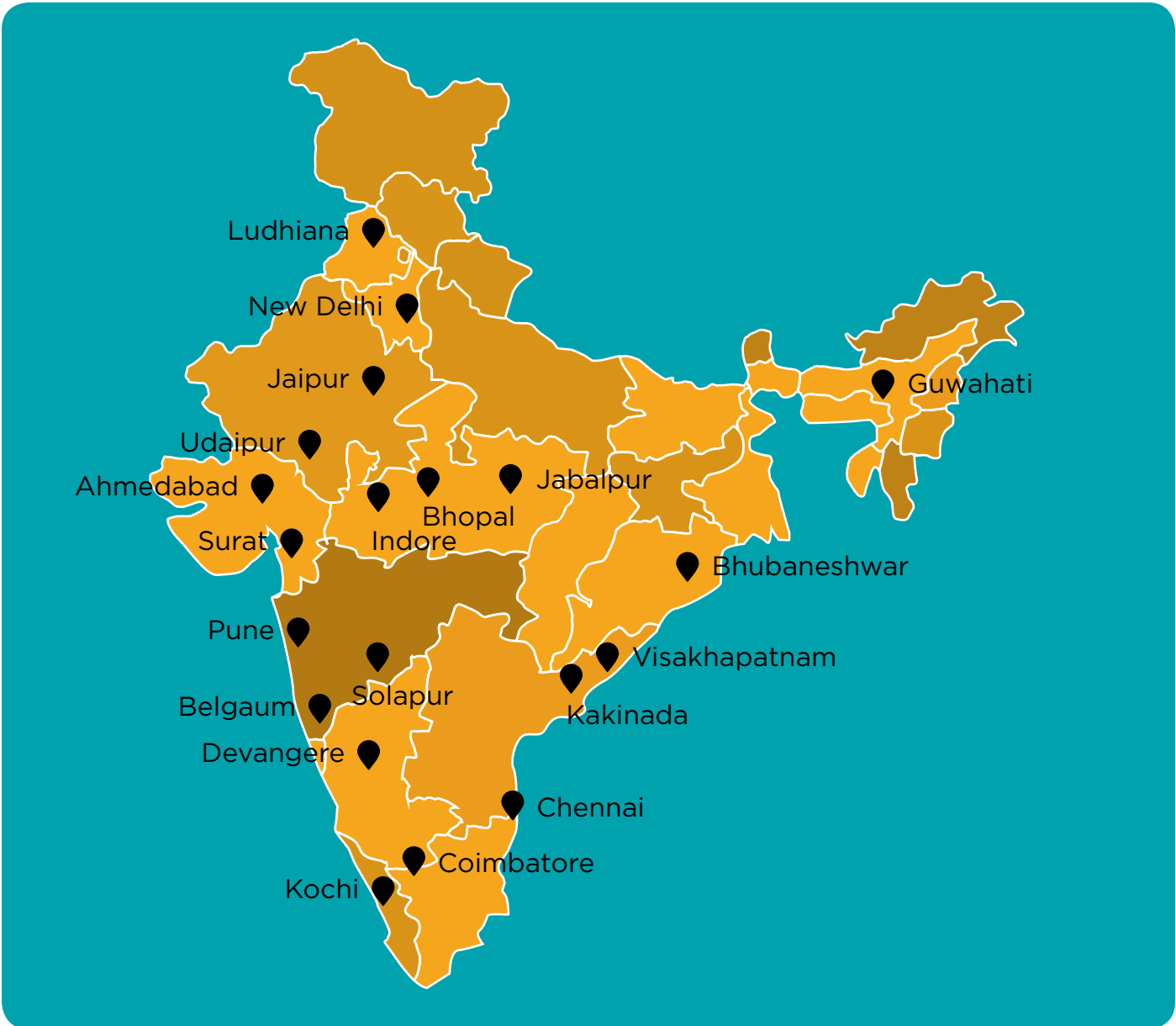
Profiles of each of the 20 smart cities can be found by accessing:
http://smartcities.gov.in/Cities_Profile.htm

¹² The number of cities participating in the challenge is presently only 97, as two states have not selected and submitted the foreseen number of candidates and another failed to submit the SCP. For all practical purposes this report will refer to 100 cities throughout.

¹³ Refer to appendix 1 for a detailed list of the 20 winning cities

BOX 7 PRELIMINARY 100 SMART CITIES TIMELINE


BOX 8 MAP OF THE FIRST 20 SMART CITIES



Special 'fast track' round

The geographical distribution of the top 20 cities reveals that all States/ Union Territories (UTs) were not covered in the first round. This led the MoUD to provide these States/UTs with a second chance through a special 'fast track', giving the top cities in the remaining 23 states/UTs the possibility to submit their upgraded proposals before the second round¹⁴. Deadline for re-submission was April 15th 2016. Proposals achieving the benchmark set by the winning cities will become eligible for funding on accelerated basis in 2016-17. The announcement of 'fast track' winners is expected to be made in June 2016. As in the regular rounds, cities are encouraged to seek 'handholding' support by mentor institutions and external agencies to upgrade their proposals.

Round II

Round II of the challenge (2016-17) opened on April 1 2016. The remaining 54 cities, as well as those cities that did not make the cut in the 'fast track' round, will compete with their revised proposals¹⁵. Deadline for submission is June 30 2016. For the 2nd challenge round it is expected that up to 40 cities will be announced in August 2016.

Details of subsequent rounds of the challenge are yet to be defined by the MoUD.



¹⁴ Refer to appendix 2 for an overview of the 23 fast track cities

¹⁵ Refer to appendix 3 for an overview of round 2 cities



SMART CITY PROPOSAL

As per MoUD guidelines, each city/ULB should formulate its own concept, vision, goals and plan for a Smart City. The MoUD allocated INR 20 million for consultancy services to be selected from a group of pre-selected consultancy companies specifically for this task¹⁶. The SCP should be appropriate to the local context, resources and levels of ambition. The SCP should also address aspects such as citizen engagement, mobilisation of resources, collaborations (see box 9), as well as intended outcomes in terms of infrastructure and ‘smart applications’ for both area-based and pan-city).

BOX 9 KEY CONSIDERATIONS FOR SCP FORMULATION

- Distinct City Identity
- Citizen Engagement Strategy
- Vision and Goals
- Strategic Plan
- Pan-City Solution
- Area-Based Development
- Implementation Framework
- Citizen-friendly and Cost Effective Governance
- Financing Plan
- Benefits and Impact

Area-Based Development and Pan-City Initiatives

Each SCP is expected to apply strategic planning principles and is to contain both area-based development plans and pan-city initiatives. There are three basic models for **area-based development** in cities, classified as Retrofitting, Redevelopment and Greenfield. Cities must utilise at least one of these methods or a mix thereof in the development of their smart city. Area-based developments must contain all ‘Essential Features’ as per MoUD guidelines (see box 10).

¹⁶ Refer to appendix 6 for list of MoUD empanelled consultancy firms.

Retrofitting

An area of more than 500 acres is identified by each city in consultation with citizens¹⁷. The cities have to prepare a strategy to make this area smart, taking into account the area's existing infrastructure services and the vision expressed by the residents. Since existing structures are largely to remain intact in this model, significantly improved infrastructure service levels, and a wider spread of smart applications, are expected for the retrofitted Smart City. This strategy may also be completed in a shorter time frame, enabling **replication** in another part of the city.

Redevelopment

Redevelopment initiatives will replace the existing built environment and enable co-creation of a new urban layout with enhanced infrastructure. An area of more than 50 acres is to be identified by ULBs in consultation with its citizens.

Greenfield Development

Smart solutions (see box 11) will be implemented in previously vacant lands to address the needs of the expanding populations around city areas.

Pan-city

SCPs should also contain at least one **pan-city** feature. The idea is to incorporate 'smart planning' in existing or non-existing infrastructure to promote inclusivity and improve environmental outcomes. Selected Smart Solutions will be applied to the existing city-wide infrastructure. Application of Smart Solutions will involve the use of information, data and technology to improve city infrastructure and services.

Evaluation Criteria

SCPs are assessed through City-level Criteria (30%) and pan-city and area-based developments (70%)¹⁸. **City-level Criteria** include evaluation metrics based on the vision, goal, strategy and scope for improvement regarding the city. It also evaluates the citizen engagement strategy describing the types of individuals, groups and communities targeted, the engagement methodology, design of feedback and suggestion loops, and processes of integrating citizen ideas within smart planning. **Pan-city and area-based developments** are measured on the concept, impact, processes, implementation framework and cost effectiveness of the initiated projects, as well as the 'smartness' of solutions.

¹⁷ In North Eastern and the Himalayan States, the area requirements for both retrofitting and redevelopment will be one-half of the general requirements.

¹⁸ MoUD SCP Template 2015

BOX 10 ESSENTIAL FEATURES FOR AREA-BASED DEVELOPMENT

- i. Assured electricity supply with at least 10% from solar energy
- ii. Adequate water supply including waste water recycling and storm water reuse
- iii. Sanitation including solid waste management
- iv. Rain water harvesting
- v. Smart metering
- vi. Robust IT connectivity and digitalisation
- vii. Pedestrian-friendly pathways and encouragement of non-motorised transport (e.g. walking and cycling)
- viii. Intelligent traffic management, non-vehicle streets/zones, smart parking
- ix. Energy efficient street lighting, innovative use of open spaces
- x. Aesthetic improvement
- xi. Safety for citizens, especially children, women and elderly
- xii. At least 80% buildings should be energy efficient and green buildings (additional for redevelopment and greenfield only)
- xiii. For total housing provided in greenfield development at least 15% should be in the affordable housing category
- xiv. Additional 'smart' application



BOX 11 EXAMPLES OF SMART SOLUTIONS**E-GOVERNANCE AND CITIZEN SERVICES**

- Public Information, Grievance Redressal
- Electronic Service Delivery
- Citizen Engagement
- Citizens - City's Eyes and Ears
- Video Crime Monitoring

**WASTE MANAGEMENT**

- Waste to Energy and Fuel
- Waste to Compost
- Every Drop to be Treated
- Treatment of C&D Waste

**WATER MANAGEMENT**

- Smart Meters and Management
- Leakage Identification
- Preventive Maintenance
- Water Quality Monitoring



ENERGY MANAGEMENT

- Smart Meters & Management
- Renewable Sources of Energy
- Energy Efficient & Green Buildings



URBAN MOBILITY

- Smart Parking
- Intelligent Traffic Management
- Integrated Multi-Modal Transport



OTHERS

- Tele-Medicine
- Incubation/Trade Facilitation Centres
- Skill Development Centres

IMPLEMENTATION

When the expert panel appointed by the MoUD has evaluated the SCPs, cities will be selected for funding. Special Purpose Vehicles (SPV) will be created under the Companies Act to implement the proposal at the city level.

Special Purpose Vehicles

The SPV will be responsible for managing, operating, evaluating and reporting the Smart City development projects within their city. The SPV may appoint Project Management Consultants (PMC) for designing, developing, managing and implementing projects.

The SPV will be headed by a full time CEO and will have nominees of the Central Government, State Government and ULB on its Board. Government representatives must ensure that the SPV has access to sufficient revenue streams and ensure that the SPV eventually becomes self-sustainable. Furthermore, they must support initiatives for public infrastructure by supporting joint ventures, subsidiaries, public private partnerships and turnkey contracts.

A central reason for the creation of SPVs in the 100 SC programme is to ensure operational independence and autonomy in decision making and mission implementation. To this end, MoUD guidelines encourage the State Government and the ULB to adopt predefined best practices to create empowered SPVs by delegating powers either to the CEO of the SPV directly or to the Board of the SPV.



BOX 12 EACH CITY'S SPV WILL BE CENTRAL

- Approving and sanctioning of projects, including their technical appraisal
- Executing the Smart City Proposal with complete operational freedom
- Taking measures to comply with the requirements of MoUD with respect to the implementation of the 100 SC programme
- Mobilising resources within timelines and taking the measures necessary for the mobilisation of resources
- Approving and acting upon the reports of a third party Review and Monitoring Agency
- Creating an overview of capacity building activities
- Ensuring timely completion of projects according to set timelines
- Undertaking the review of activities of the programme including budget, implementation of projects, and preparation of SCP and co-ordination with other missions/schemes and activities of various ministries
- Monitoring and reviewing quality control related matters and acting upon arising issues
- Incorporating joint ventures and subsidiaries and entering into public private partnerships
- Entering into contracts, partnerships and service delivery arrangements
- Determining and collecting user charges as authorised by the ULB
- Collecting taxes, surcharges etc. as authorised by the ULB

Release of funds

All the 100 shortlisted cities were given an advance payment of INR 20 million for the preparation of the SCPs. These funds will help cover expenses for consultancy services. To create a higher initial corpus, Gol proposed to allocate INR 2 billion to each selected Smart City in the first year, followed by INR 1 billion for the next three years.

Funds can be used as follows:

- Project funds – 93%
- State/ULB A&OE – 5%
- MoUD A&OE – 2%

City Score Card

Cities (the established SPVs) must meet a number of criteria before funds are released, including achieving the milestones in their SCP roadmap. An important document in this regard is the 'City Score Card', which must be submitted both quarterly and annually to the MoUD in order to receive scheduled GoI funding.

The City Score Card includes concrete output criteria such as the number of power outages, non-revenue water, AT&C losses, and the collection of property tax. Furthermore, it assesses the ability of the SPV to attract external funding. The aim is to encourage SPVs to be proactive in making full use of its discretion to apply user charges, fees etc. on citizens. Hence, performance on 'resource mobilisation' constitutes a key criterion in the City Score Card.

GOVERNANCE STRUCTURE FOR OVER-ALL SMART CITY MONITORING

In order to overcome existing weaknesses in urban governance, the monitoring of the entire 100 SC Programme will be conducted on a three-tiered governance structure headed by an Apex committee that includes various national, state-led and city-level committees. The Apex committee structure can be seen in appendix 4.

BOX 13

GOVERNANCE STRUCTURE FOR SMART CITY MONITORING

National level: Apex Committee - headed by Secretary, MoUD

National Mission Director

High Powered Steering Committee - chaired by the Chief Secretary

City level: CEO of the SPV is the convener of the Smart City Advisory Forum



FINANCING OF THE PROGRAMME AND THE SPVS

The 100 SC programme is operated as a Centrally Sponsored Scheme (CSS) and the Central Government proposes to give financial support to the extent of INR 480 billion over the five years the programme is running. An equal amount, on a matching basis, will be contributed by the States. However, the total of INR 960 billion (INR 9.6 billion per city) in core funding is only conceived as seed money: the actual financial requirements are estimated to be approximately five times higher.

To bridge this funding gap, the Indian government has requested assistance for its 100 SC programme from several multilateral banks, including the World Bank and the Asian Development Bank (USD 0.5 and 1.0 billion respectively over a five-year period). WB and ADB funding is foreseen to be used to provide funds to SPVs. Loans are expected to be available in 2016 for use by Round I Smart Cities¹⁹.

In addition, GoI has obtained commitments on financial cooperation from its biggest bilateral donors, including Germany, US, UK and France. While providing overall strength to the 100 SC Mission, money from bilateral donors is expected to be tied to deliveries, e.g. technical assistance and cooperation, from the concerned countries²⁰.

¹⁹ Refer to appendix 1 for list of 20 winning cities in Round I

²⁰ Refer to appendix 5 for an overview of international collaboration on Indian smart cities



PPPs are seen as another means of financing, bringing private capital to public projects. However, PPP success stories are rare in India, mainly because of inadequate cost recovery and associated political sensitivity. Given the challenges, the GoI supports ULBs entering into PPP arrangements through standardisation of documents with the aim of lending a greater degree of transparency, consistency and predictability to the entire partnering and procurement process.

Historically, India has a poor track record when it comes to recovering costs, particularly with regards to urban infrastructure. With the exception of telecom, user charges are generally priced below real costs. On average, Indian cities only succeed in recovering approximately 80% of costs related to provision of gas, 60% of power costs and as little as 30% of the costs of water management²¹. Therefore, the viability and degree of user charges are key criteria for evaluating cities in the 100 SC Programme.

²¹ Financing of Smart Cities'. Presentation by Kumar V Pratap. Economic Adviser. Ministry of Urban Development

Finally, ULBs tend to lack the necessary credit worthiness to issue municipal bonds. Also, almost all municipal acts in India impose restrictions on the power of ULBs to borrow funds, in terms of balancing their budgets and seek permission of the state government before borrowing. These permissions are project-based and are granted on an ad hoc basis. Given the needs of 100 SC Mission, the Ministry of Finance has taken up a project for assessing some cities for their credit worthiness and bond readiness.

CONVERGENCE WITH OTHER GOVERNMENT INITIATIVES

This report focuses on Smart Cities in India, which is the most high-profiled of the urban development schemes introduced by the incumbent government. Most of the 100 selected Smart Cities are also among those 500 cities that are part of the AMRUT (Atal Mission for Rejuvenation and Urban Transformation) and they also have access to funds in the Swachh Bharat Abhiyan (Clean India Mission). Some even converge with the National Heritage City Development and Augmentation Yojana (HRIDAY). Representing opportunities for entering the urban development sector in India in their own right, in many cities these programmes are also likely to play their respective parts in the overall financing of Smart Cities and convergence with these programmes is highly encouraged by GoI²².

AMRUT

AMRUT was launched in June 2015 at the same time as the 100 SC Mission. The scope of AMRUT is to provide basic urban services to households (e.g. water supply, sewerage and urban transportation) and build amenities in cities to improve the quality of life. The poor, the disadvantaged and children are a national priority under this scheme. The AMRUT Mission has been allocated funds comparable to the amount for the 100 SC Mission. Yet, these INR 500 billion are to cover 500 Indian cities and efforts will hence be more thinly spread. AMRUT builds on results and learnings from the previous JnNURM (Jawaharal Nehru National Urban Renewal Mission). As the JnNURM, AMRUT is financed by a centrally sponsored scheme, but administratively it draws heavily on State involvement, thus exemplifying the shift towards State-led initiatives²³. AMRUT follows a project-based approach, whereas 100 SC follows an area-based strategy.

²² Refer to next page for details on these programmes.

²³ AMRUT 2016

Swachh Bharat

Swachh Bharat is a national campaign, launched by Gol to clean up Indian streets, roads and infrastructure. Launched on the 2nd October 2014, on the 150th birthday of Mahatma Gandhi, the mission aims to achieve universal sanitation and put sanitation in focus by 2019. Funds are focused in building individual and community toilets, and solid waste management systems in urban areas. The campaign has launched a “Clean India” movement where citizens are becoming active in promoting cleanliness. The campaign covers over 4,000 cities and towns²⁴.

HRIDAY

HRIDAY was launched in 2015 for the purpose of holistic development of heritage cities. The scheme was in place to incorporate urban planning, the local economy, service delivery and infrastructure provisions in the conservation of heritage cities. INR 5 billion has been allocated to this scheme by the national government. Cities already included in the scheme include Ajmer, Amravati, Amritsar, Badami, Dwaraka, Gaya, Kanchipuram, Mathura, Puri, Varanasi, Velankanni and Warangal²⁵. The mission focuses on the restoration of heritage assets such as temples and monuments. However, the mission also covers the development of urban infrastructure closely connected to such heritage assets.

Housing for All

Housing for all by 2022 (Pradhan Mantri Awas Yojana, PMAY) is a programme for 1) slum rehabilitation of with participation of private developers using land as a resource; 2) promotion of affordable housing for weaker section through credit linked subsidies; 3) affordable housing in partnership with Public & Private sectors and 4) subsidies for beneficiary-led individual house construction or enhancement. I. The government has identified 305 cities and towns have been identified in 9 states for beginning construction of houses for urban poor.

²⁴ Swachh Bharat 2016

²⁵ HRIDAY 2016



Smart Liveable
Cities in India

OPPORTUNITIES FOR DANISH COMPANIES





FACT-FINDING MISSION SUMMARY

In order to gauge the scope of opportunities for Danish companies, create an operative network, and not least in order to obtain a first-hand understanding of Urban India's ground realities, the Royal Danish Embassy, New Delhi felt a need to conduct fact-finding missions to cities involved in the 100 SC Mission.

With funding from the East Asiatic Foundation, three fact-finding missions were carried out by the Innovation Centre Denmark in the period from December 2015 to March 2016 to the cities of Udaipur (Rajasthan), Erode (Tamil Nadu) and Kakinada (Andhra Pradesh). These fact-finding missions and the ensuing reports have provided the Embassy added value in terms of:

- First-hand knowledge and understanding of the situation in each of the cities
- Identification of real opportunities for Danish companies.
- Establishment of working relations with city and state officials as well as other key stakeholders

As a result, the Embassy today stands well-equipped to assist Danish players that contemplate taking advantage of the market opportunities arising in the urban development area in India these years, including through collaboration on some of the identified projects in the three cities.

The overall impression from the missions was that the three cities showcased a strong ownership to the smart city mission and displayed genuine commitment to making it a success. Danish competencies found general recognition and acceptance at both city and state levels. The Embassy received great interest from the officials and great collaborative efforts were displayed: right from setting up meetings with relevant stakeholders, site visits, sharing of relevant documents/proposals, to presenting concrete opportunities for collaboration. Given the relationship that has been built with the cities and the scope of opportunities, the Embassy believes that visits to these or other cities can help Danish interested companies in capitalising on the prospects of the 100 SC Mission.

Below is a snapshot of the potential projects identified for Danish competencies within each city. A full description of opportunities is available in the individual city reports.

Udaipur

Udaipur is located in the north-western part of India in the state of Rajasthan. It is the sixth largest city in Rajasthan in terms of population and has a total population of 3.1 million (as per census 2011). The total urban population in Udaipur district in 2011 stood at roughly 610,000, witnessing a growth rate of 26.8% as compared to the state's average rate of urbanisation of 29% in the period 2001-2011.

The essence of the smart city plan in Udaipur is to enhance liveability through sustainable development, which ultimately would lead to strengthening the tourism industry and all industries influenced by it. Potential opportunities in the city are seen within the following areas:

Water and Sewage Management

- Technologies and expertise for the cleaning of lakes across the city that form the main tourist attractions;
- Evaluation of loss for non-revenue water and strategies to curb losses;

Public Utilities

- Smart Wi-Fi hotspot solutions integrated with energy saving street light solutions;
- Improving cleanliness with more dustbins and street cleaning;

Traffic Management

- Traffic reduction strategies within the city to facilitate tourist-walking streets;
- Deployment of hybrid or e-vehicles in the city;

ICT and Skills Solution

- City wide Wi-Fi hotspot solutions;
- Creation of an 'Experience Udaipur' mobile app ecosystem to guide tourists to amenities like tourist destinations, itinerary, historical references etc.





Erode

Erode lies in the north-eastern part of the South Indian state of Tamil Nadu. Erode is widely known for its textile export, popularly referred to as the 'Textile Valley of India'. Erode's total urban population increased by 17.25% to almost 1.2 million in the period 2001-2011.

The city of Erode envisions transforming itself from being a 'Textile city' to becoming 'Smart Green Erode' with liveability and sustainability as the main pillars. Potential opportunities in the city are seen within the following areas:

Waste Water Cleaning

- River cleaning, bank development, rehabilitation of encroachments;

Traffic Management

- Big Data analytics and sensor proliferation for traffic monitoring and law enforcement;
- smart transportation system in the city and deployment of hybrid and e-vehicles;

Clean Energy

- Development of bio mass energy sources;
- Smart waste collection within the city;

Smart Agriculture

- Erode in its present state has around 60% farmland and a large section of the population engages in agriculture, representing unique opportunities for smart farming techniques.

Kakinada

Kakinada is a city in the southern Indian state of Andhra Pradesh. The Port of Kakinada is the principal and second largest port in the state. It is known as the “Fertilizer City” of Andhra Pradesh and has a diverse industrial presence. As per census 2011, the total population in Kakinada city stood at roughly 380.000.

The vision of the city is to “Transform Kakinada from Pensioners’ Paradise to Economic Destination” and make it economically “vibrant, inclusive, liveable and sustainable” based on the strengths of ports, marine industry and tourism. Potential opportunities in the city are seen within the following areas:

Waterfront Development along the Canal:

- The primary area of interest expressed by the Municipal Corporation of Kakinada for Danish companies is the transformation of a 2.5-kilometre waterfront area/canal into a recreational area.

Solid Waste Management

- Advanced solid waste monitoring and management solutions.
- Expert planning, solution and technology inclusion in extending sewerage network.

Maritime and Fish Industries

- Development of modern fish processing and packaging facilities.
- Skills development of over 40,000 fishermen and shipbuilders.

Transport, Mobility and Walkability:

- Smart pedestrian facilities.
- Traffic monitoring and data analytics.
- Smart traffic signals.



PARTICIPATING IN THE 100 SC MISSION

For companies wanting to participate in the 100 SC programme, the sheer scale and complexity of the programme can be overwhelming, and it may be difficult to determine a suitable entry point. Also, some features of the 100 SC approach and process are new in an Indian context, so while being structured and overall coherent, not all the steps of the 100 SC process have been defined from its outset. This is in keeping with the experimental character of the programme. Still, being market driven and with a high degree of transparency it is seen as a promising opportunity for Danish companies.

Before going through the different stages in the SC process and the respective entry points offered, it is valid to mention a few general points, that companies are well-advised to keep in mind when approaching the market:

Organisational commitment

The market for smart cities is huge, but also competitive. In order to enter and capture a share of this market, Danish companies should give strategic priority to the Indian urban market.

Early engagement and dialogue

Key players, such as urban planners and officials involved are not acquainted with the kind of advanced, integrated solutions that Danish companies can offer in both planning and execution. There is a risk that some opportunities will be eliminated in the conceptualisation and planning stages of Smart Cities. This underlines the need to engage early on with cities and to shape their requirements.

Build relationships with a few cities

A key success factor for Danish companies in a complex foreign business environment is to have early and appropriate access to cities under consideration, and thereby be ahead of the competition. In this regard, the importance of existing relationships cannot be overemphasized. After a careful mapping of the status of cities in the SC programme and their requirements, it is advised to approach one or only a few cities. The Danish Embassy has developed a valuable network at both central, state and city levels, which could be built on.

Team up with local partners

Once a particular city is shortlisted and its requirements identified, Danish companies should consider their own competitive position for succeeding in that market. In light of this, they could approach the city directly or through an Indian, Danish or international partner with a local set-up.

BOX 14 CONFEDERATION OF INDIAN INDUSTRY (CII) AS A PARTNER

CII is reaching out globally to identify partners that can take a lead position in a consortium for the implementation of a holistic Smart City solution. It would be the responsibility of the consortium leader to ensure seamless delivery of all components of the development, with the consortium members executing individual components of the solution. Based on discussions to date, a number of global companies have contracted with CII to take on the role of the lead consortium member, and to participate in the tenders that would be issued for projects in due course.

CII has signed MoUs with 11 Indian cities and 5 companies leading separate consortiums. The companies are Siemens, Hitachi, CISCO, Indra Systems Ltd and Essel Infra Pvt Ltd. CII is still seeking to engage more consortium leaders in order to match the number of cities.

Since holistic solutions are required in order to address the complex challenges of implementing a successful smart city solution, Danish companies that can act as a project manager to integrate various technologies would be ideally placed to participate in and lead a consortium.

The central role of the SPV

Regardless of choice of local partner, Danish companies must keep in mind the central role of the SPV in the development of smart cities in India. Each city's SPV will be responsible for the implementation of the smart city plan for its city, and is the most important and relevant agency to engage with.

Where is the city in the process?

First step to evaluate opportunities is to determine where in the process the particular Smart City is. Is it still preparing its SCP? Has it been picked for funding and already formed an SPV? Is the PMC tender or other tenders already out? Every step involves different sets of opportunities, entry points and players. In January 2016, on the basis of the scoring done by the MoUD, the top 20 cities were selected for funding for the financial year 2015-16²⁶. Danish companies could approach the 100 SC programme through a mapping of these cities' status in the 100 SC competition.

²⁶ Refer to appendix 1 for the list of cities

Advisory services, including PMCs

Danish consultants may be interested in engaging with cities that are yet to qualify for grants, and cities that must revisit their Smart City Proposals. Companies that can act as project management consultants (PMC) could seek early engagement with the cities by offering advice on designing the detailed project reports (DPRs) and tender documents including specifications for the execution of the physical works. A track record of working with state-of-the-art technology and solutions will improve consultancy firms chances of qualifying as PMC.

SPVs can opt for various models of engagement with PMCs as stipulated by MoUD guidelines. At least one PMC is foreseen for each city, but separate PMCs on the area-based and the pan-city solutions respectively is also a possibility. It is expected that many SPVs will opt for a model with one (or very few) PMC given the complex character of the task and the need for strong coordination. As of yet, it is unclear what the foreseen scope and 'depth' of the PMC's tasks will be. At best the concrete model will vary from city to city.

The MoUD has empanelled state-wise a list of consultants²⁷. Some of these consultants are specialised in urban development while others have a broader scope. Danish companies are advised to recognise the expertise of the consultants they wish to engage with.

Detailed project reports

It can be expected that - once operational and the overall tender strategy is in place - the SPVs will submit DPRs (see box 15) through either the selected PMC or through a project-based consultancy firm. The DPRs will initiate the tendering of concrete projects relating to e.g. drinking water, power supply, sewerage, solid waste management, metro, elevated road/ underpasses, internet connectivity, communication, and information technology etc.

Technology and solutions

What are the cities plans and how do they match the firm's competencies? Obviously, to identify opportunities for products and services, a mapping of the contents of the SCP and the foreseen projects is required. While, Danish technology and service providers may find it more relevant to engage with cities that have already qualified and are in the process of setting up the SPV, it is worthwhile pursuing early contacts to present the kind of advanced solutions offered by Danish companies that SPVs would often not be aware of, and therefore not include in tenders.

²⁷ Refer to appendix 6 for a list of MoUD empaneled consultants

Public tenders

Projects will normally be awarded through an open tender process where applications will be judged on merit. Until recently, the norm has been that the lowest priced project won the tender. However, there is now a greater emphasis on quality and on the economic sustainability of the deliverable. By and large, the quality-and-cost-based-selection (QCBS) is expected to be followed by either 70/30 or even 90/10 evaluation parameters implying a greater stress on quality.

Pilot projects

There is also the possibility of implementing pilot/demonstration projects that, when successful, could be rolled out to a larger area or replicated in other locations. There are various opportunities for the funding of such pilot projects. These are outlined in appendix 7.



HOW THE ROYAL DANISH EMBASSY IN INDIA CAN ASSIST

The Royal Danish Embassy in New Delhi is actively engaged in mapping and supporting business opportunities for Danish companies. This includes support for Danish companies seeking to enter the market for the 100 SC. In view of the ongoing devolution of both competencies and finances from central to state level (and even local level), the Embassy is pursuing a strategy of strengthening interaction and collaboration with states identified as interesting partners for Denmark. This includes the 100 SC area, but also in sectors like water, energy efficiency, logistics etc.

In the Autumn of 2015, the Embassy formed a Strategic Sales Alliance (SSA) - 'Smart Liveable City Alliance' - consisting of Ramboll A/S, HeSaLight A/S, Mosbaek A/S and Danish Water Forum . The Embassy has assisted the SSA in gaining access to relevant decision-makers at central, state and city levels, providing privileged insights and identifying opportunities and concrete projects. Given its longer term perspective, the SSA has proven a solid framework for creating a strategic foothold in the field of Smart Liveable Cities. The Embassy is seeking to extend this approach to other related areas with high potential, including on water savings and energy efficiency.

The Embassy has mapped all 100 (97) cities on parameters that reflect Danish competencies, including water and wastewater management, efficient street lighting solutions, stormwater management and area-based city planning.

Hence, the Embassy can assist companies in mapping opportunities by matching the cities' needs with specific company competencies.

Further, the Embassy can also assist Danish companies in finding reliable and relevant local partners for the specific cities.

There can be city-specific or sector-specific consortia formation so as to enable Danish companies to compete with other large companies on an equal footing.



Mosbaek
Flow Regulators



BOX 15

KEY ELEMENTS OF THE 100 SC CYCLE AND POSSIBLE
OPPORTUNITIES FOR DANISH COMPANIES

Activity

Timeline

Preparation/improvement of Smart
City Proposal (SCP)

Round I: Aug - Dec 2015
Round II : 1 Apr 2016 - 30 Jun 2016

Deadline for submission of SCPs to
MoUD

Round I: Dec 2015
Fast Track: 15 Apr 2016
Round II: 30 Jun 2016

MoUD evaluation of SCP and
selection of winners

Round I: Jan 2016
Round II: Aug 2016

Establishment of SPV

3-4 months from selection as
winner (Round I: March/April 2016)

RFP on PMC

N/A

Option of appointing a PMC
(DPR Designing)

N/A

Tender on DPRs

N/A

Feasibility studies

N/A

Tender on works and construction

N/A

Procurement process

Opportunities and modes of engagement for DK companies

Pre-qualified by MoUD	<p>INR 20 Million from MoUD to each city for preparation of SCP</p> <p>City officials are fairly receptive to ideas and suggestions on overall design of SCP and innovative solutions</p> <ul style="list-style-type: none"> • Direct engagement through embassy • Indirect through empanelled consultancy company
N/A	Negligible
N/A	<p>Negligible</p> <p>Selected cities proceed to establishment of SPV</p> <p>Other cities will go back to improvement of SCP</p>
N/A	<p>Essentially an internal process of the respective cities/states.</p> <p>However, hands-on experiences with organising similar entities possible asset for interaction.</p>
N/A	N/A
Direct engagement / tender	<p>Prioritising, 'lumping together' or 'slicing' the various projects of the SCP is of potentially strategic importance for the ensuing process but not necessarily perceived as such by cities</p> <p>If contact is already established a case could be made for advising cities on how to structure the DPR tender by acting as PMC</p>
Public Tender	<p>For the tender process itself, a high degree of transparency is expected.</p> <ul style="list-style-type: none"> • Tenders up to INR 80 million • Opportunities in partnering with local consultancy companies
Public Tender	N/A
Public Tender	<p>High degree of transparency expected. Tough price competition on Indian companies' strong turf. Opportunities for Danish companies arising as mainly acting as sub suppliers to Indian contractors</p>

USEFUL LINKS AND RESOURCES

Smart Cities Mission - Official website of the 100 Smart Cities Mission, Ministry of Urban Development, Government of India

<http://smartcities.gov.in>

Progress of SPV for India's Smart Cities

<http://smartcities.gov.in/spv.aspx>

India Smart Cities Challenge - official website of the 100 Smart Cities Challenge

<http://www.smartcitieschallenge.in>

SCPs of first 20 Cities

Ahmedabad (Gujarat)

<http://smartcities.gov.in/writereaddata/winningcity/AhmedabadSCp.pdf>

Belagavi (Karnataka)

<http://smartcities.gov.in/writereaddata/winningcity/BelagaviSCp.pdf>

Bhopal (Madhya Pradesh)

<http://smartcities.gov.in/writereaddata/winningcity/BhopalSCp.pdf>

Bhubaneswar (Odisha)

https://mygov.in/sites/default/files/master_image/Bhubaneswar-Smart-City-Draft-Proposal.pdf

Chennai (Tamil Nadu)

<http://smartcities.gov.in/writereaddata/winningcity/ChennaiSCp.pdf>

Coimbatore (Tamil Nadu)

<http://smartcities.gov.in/writereaddata/winningcity/CmbSCP.pdf>

Davanagere (Karnataka)

<http://smartcities.gov.in/writereaddata/winningcity/DavanagereSCp.pdf>

Guwahati (Assam)

<http://smartcities.gov.in/writereaddata/winningcity/GuwahatiSCp.pdf>

Indore (Madhya Pradesh)

<http://smartcities.gov.in/writereaddata/winningcity/indoreAnnexures.pdf>

Jabalpur (Madhya Pradesh)

<http://smartcities.gov.in/writereaddata/winningcity/JabalpurSCp.pdf>

Jaipur (Rajasthan)

http://smartcities.gov.in/writereaddata/Jaipur_smartcity.pdf

Kakinada - (Andhra Pradesh)

<http://smartcities.gov.in/writereaddata/winningcity/kakinadaSCp.pdf>

Kochi (Kerala)

<https://drive.google.com/file/d/0B9LlwCubfdFASHJJZ2RtMDRDQVU/view>

Ludhiana (Punjab)

<http://smartcities.gov.in/writereaddata/winningcity/LudhianaSCP.pdf>

NDMC (Delhi)

https://blog.mygov.in/wp-content/uploads/2015/12/Smart-City-Delhi_v3.pdf

Pune (Maharashtra)

http://www.punecorporation.org/informpdf/Smart_City/SPC_Part_1.pdf

Solapur (Maharashtra)

<http://smartcities.gov.in/writereaddata/winningcity/solapurSCp.pdf>

Surat (Gujarat)

http://smartcities.gov.in/writereaddata/winningcity/SCP_%20SURAT.pdf

Udaipur (Rajasthan)

<http://smartcities.gov.in/writereaddata/winningcity/udaipurSCp.pdf>

Visakhapatnam (Andhra Pradesh)

<http://smartcities.gov.in/writereaddata/winningcity/VishakapatnamSCP.pdf>

Official city websites of first 20 cities

Ahmedabad (Gujarat)

http://ahmedabadcity.gov.in/portal/jsp/Static_pages/pi_smartcity.jsp

Belagavi (Karnataka)

<http://www.belgaumcity.mrc.gov.in>

Bhopal (Madhya Pradesh)

<http://www.smartcitybhopal.org>

<http://www.bhopalmunicipal.com>

Bhubaneswar (Odisha)

<http://www.smartcitybhubaneswar.gov.in>

<http://www.bmc.gov.in>

Chennai (Tamil Nadu)

<http://www.chennaicorporation.gov.in>

Coimbatore (Tamil Nadu)

<https://www.ccmc.gov.in/ccmc/>

Davanagere (Karnataka)

<http://www.davanagerecity.mrc.gov.in>

Guwahati (Assam)

<http://www.gmcportal.in>

Indore (Madhya Pradesh)

<http://www.smartcityindore.org>

<http://www.imcindore.org>

Jabalpur (Madhya Pradesh)

<http://www.smartcityjabalpur.org>

<http://www.jmcjabalpur.org>

Jaipur (Rajasthan)

<http://www.jaipursmartcitychallenge.com>

<http://jaipurmc.org>

Kakinada (Andhra Pradesh)

<http://www.kakinadamunicipalcorporation.com>

Kochi (Kerala)

<https://cochinmunicipalcorporation.kerala.gov.in>

Ludhiana (Punjab)

<http://smartcityludhiana.in>

<http://main.mcludhiana.gov.in>

NDMC (Delhi)

<https://www.ndmc.gov.in>

Pune (Maharashtra)

<http://www.punesmartcity.in>

<http://www.punecorporation.org>

Solapur (Maharashtra)

<http://www.solapursmartcity.com>

<http://www.solapurcorporation.gov.in>

Surat (Gujarat)

<https://www.suratmunicipal.gov.in>

Udaipur (Rajasthan)

<http://udaipursmartcity.in>

<http://www.udaipurmc.org>

Visakhapatnam (Andhra Pradesh)

<http://www.visakhapatnamsmartcity.com>

<https://www.gvmc.gov.in>



APPENDICES

APPENDIX 1 - 20 WINNING CITIES IN ROUND I OF CHALLENGE

Rank no.	Name of State UT	Name of City	Score (%)
1	Odisha	Bhubaneswar	78.83
2	Maharashtra	Pune	77.42
3	Rajasthan	Jaipur	73.83
4	Gujarat	Surat	68.16
5	Kerala	Kochi	66.98
6	Gujarat	Ahmedabad	66.85
7	Madhya Pradesh	Jabalpur	63.03
8	Andhra Pradesh	Visakhapatnam	61.12
9	Maharashtra	Solapur	60.83
10	Karnataka	Davanagere	59.93
11	Madhya Pradesh	Indore	59.89
12	Delhi	NDMC	59.69
13	Tamil Nadu	Coimbatore	58.74
14	Andhra Pradesh	Kakinada	58.19
15	Karnataka	Belagavi	57.99
16	Rajasthan	Udaipur	57.91
17	Assam	Guwahati	57.66
18	Tamil Nadu	Chennai	56.16
19	Punjab	Ludhiana	55.84
20	Madhya Pradesh	Bhopal	55.47

APPENDIX 2 – CITIES TO BE UPGRADED IN FAST TRACK

S. No	Rank no.	Name of State/UT	Name of City	Score (%)
1	23	Telangana	Warangal	54.79
2	24	Chandigarh	Chandigarh	54.73
3	29	Uttar Pradesh	Lucknow	53.24
4	30	West Bengal	Newtown Kolkata	53.1
5	32	Goa	Panaji	52.99
6	39	Arunachal Pradesh	Pasighat	52.26
7	59	Himachal Pradesh	Dharamshala	48.1
8	60	Haryana	Faridabad	47.86
9	62	Chhattisgarh	Raipur	47.6
10	65	Bihar	Bhagalpur	47.39
11	70	Meghalaya	Shillong	46.65
12	71	Sikkim	Namchi	46.27
13	73	A & N Islands	Port Blair	46.25
14	74	Daman & Diu	Diu	46.07
15	75	Puducherry	Oulgaret	46.05
16	78	Dadar & Nagar Haveli	Silvassa	45.7
17	83	Manipur	Imphal	44.27
18	84	Jharkhand	Ranchi	44.04
19	85	Tripura	Agartala	43.58
20	90	Nagaland	Kohima	42.55
21	93	Mizoram	Aizawl	42.06
22	95	Lakshadweep	Kavaratti	41.92
23	97	Uttarakhand	Dehradun	38.13

APPENDIX 3 – CITIES TO COMPETE IN ROUND II (1/2)

S. No	Rank no.	Name of State/UT	Name of City	Score (%)
1	21	Madhya Pradesh	Ujjain	55.03
2	22	Madhya Pradesh	Gwalior	54.82
3	25	Punjab	Amritsar	54.55
4	26	Karnataka	Shivamogga	54.36
5	27	Punjab	Jalandhar	53.82
6	28	Tamil Nadu	Madurai	53.34
7	31	Maharashtra	Nagpur	53
8	33	Tamil Nadu	Salem	52.95
9	34	Maharashtra	Nashik	52.75
10	35	Uttar Pradesh	Agra	52.69
11	36	Maharashtra	Thane	52.34
12	37	Gujarat	Rajkot	52.33
13	38	Maharashtra	Kalyan-Dombivali	52.3
14	40	Tamil Nadu	Vellore	52.04
15	41	Uttar Pradesh	Kanpur	52
16	42	Andhra Pradesh	Tirupati	51.78
17	43	Maharashtra	Greater Mumbai	51.77
18	44	Karnataka	Hubballi-Dharwad	51.71
19	45	Maharashtra	Navi Mumbai	51.68
20	46	Odisha	Rourkela	51.53
21	47	West Bengal	Bidhannagar	51.3
22	48	Gujarat	Dahod	50.92
23	49	Karnataka	Mangaluru	50.79
24	50	Rajasthan	Ajmer	50.56
25	51	Madhya Pradesh	Sagar	50.27
26	52	Uttar Pradesh	Aligarh	50.13
27	53	Karnataka	Tumakuru	49.63

APPENDIX 3 – CITIES TO COMPETE IN ROUND II (2/2)

28	54	West Bengal	Durgapur	49.52
29	55	Madhya Pradesh	Satna	48.97
30	56	Tamil Nadu	Tirunelveli	48.56
31	57	Tamil Nadu	Thoothukudi	48.33
32	58	Tamil Nadu	Erode	48.14
33	61	Tamil Nadu	Tiruchirapalli	47.7
34	63	Tamil Nadu	Dindigul	47.58
35	64	Maharashtra	Amravati	47.57
36	66	Haryana	Karnal	47.16
37	67	Rajasthan	Kota	47.15
38	68	West Bengal	Haldia	47.07
39	69	Tamil Nadu	Thanjavur	47.03
40	72	Gujarat	Gandhinagar	46.27
41	76	Tamil Nadu	Tiruppur	46.04
42	77	Maharashtra	Aurangabad	45.7
43	79	Uttar Pradesh	Allahabad	45.5
44	80	Chhattisgarh	Bilaspur	45.37
45	81	Gujarat	Vadodara	44.53
46	82	Uttar Pradesh	Jhansi	44.41
47	86	Uttar Pradesh	Moradabad	43.39
48	87	Uttar Pradesh	Ghaziabad	43.07
49	88	Uttar Pradesh	Bareilly	42.68
50	89	Uttar Pradesh	Rampur	42.67
51	91	Bihar	Bihar Sharif	42.22
52	92	Uttar Pradesh	Saharanpur	42.09
53	94	Bihar	Muzaffarpur	42
54	96	Uttar Pradesh	Varanasi	40.21

APPENDIX 4 – APEX COMMITTEE

An Apex Committee, headed by the Secretary, MoUD and other representatives from related ministries, will play an advisory role. Its key responsibilities are:

- Reviewing the list of Cities sent by the State Governments;
- Reviewing the proposals evaluated by panel of experts;
- Approving the release of funds based on progress in implementation;
- Recommending mid-course correction in the implementation tools as and when required;
- Undertaking quarterly review of activities of the scheme including budget implementation and co-ordination with other missions/ schemes and activities of various ministries.

National Mission Director

The National Mission Director will be in charge of the overall programme activities which include:

- Developing the strategic blueprint and the detailed implementation roadmap of the Smart Cities Mission, including the detailed design of the City Challenge;
- Coordinating across Centre, States, ULBs and external stakeholders to ensure that external agencies are efficiently used for preparation of SCP, DPRs, sharing of best practices, developing Smart Solutions etc.;
- Overseeing capacity building and assisting in handholding of SPVs, State and ULBs. This includes developing and maintaining a best practice repository.

State Level High Powered Steering Committee

The State Level High Powered Steering Committee (HPSC) is a committee run by State Government departments. The key responsibilities of the HPSC are:

- Providing guidance to the Mission and providing a State-level platform for the exchange of ideas pertaining to development of Smart Cities;
- Overseeing the process of first stage intra-State competition on the basis of Stage 1;
- Reviewing the SCPs and sending it to the MoUD for participation in the Challenge.

Smart City Advisory Forum

A Smart City Advisory Forum will be established for all 100 (97) Smart Cities to advise and enable collaboration among various stakeholders. These stakeholders include local government representatives, local youths, technical experts and at least one member who is either a:

- President / secretary representing registered Residents Welfare Association;
- Member of registered Tax Payers Association / Rate Payers Association;
- President / Secretary of slum level federation;
- Members of a Non-Governmental Organisation (NGO) or Mahila Mandali / Chamber of Commerce / Youth Associations.



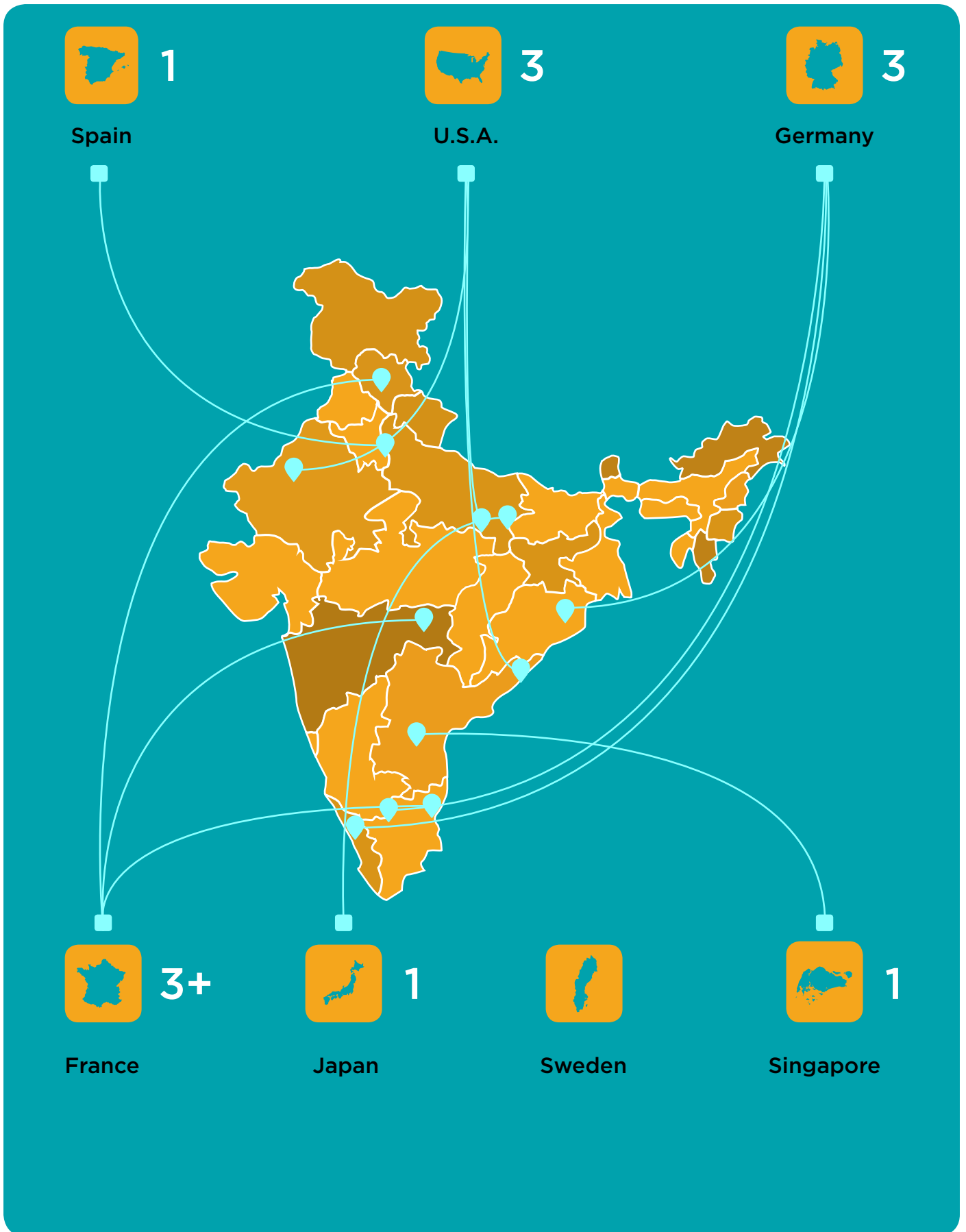
APPENDIX 5 – INTERNATIONAL COLLABORATION ON INDIAN SMART CITIES

The 100 SC initiative announced by GoI has attracted tremendous interest not only from Denmark and Danish organisations but also from other countries. Some examples are:

1. Agreement between India and the US for developing the cities of Allahabad, Ajmer and Visakhapatnam
2. Agreement between India and France for developing Chandigarh, Nagpur and Puducherry, as well as cities in Himachal Pradesh
3. The agreement between Germany and India to develop Kochi, Coimbatore and Bhubaneswar²⁸.
4. The partnership between Sweden and India to collaborate on urban initiatives such as sustainable waste management.
5. MoU between Japan and India on developing the city of Varanasi
6. MoU between India and Spain on development of Delhi
7. Singapore has partnered up with the State Government of Andhra Pradesh to build the new state capital, Amaravati, as a smart city

²⁸ The Economics Times 2016

Multiple foreign Countries are looking forward to invest and participate in the development of smart cities in India.



Most of these collaborative agreements come with a sizeable soft loan from the foreign country. For example France has promised approx. €2 billion to the city of Chandigarh. In the case of the new state capital of Andhra Pradesh, a pro-bono agreement for the planning of the new capital was signed between the Singaporean government and the government of Andhra Pradesh in December 2014.

C40

The C40 Cities Climate Leadership Group, now in its 10th year, connects more than 80 of the world's greatest cities, representing 550+ million people and one quarter of the global economy. Created and led by cities, C40 is focused on tackling climate change and driving urban action that reduces greenhouse gas emissions and climate risks, while increasing the health, well-being and economic opportunities of urban citizens.

The C40 is organised under various networks that facilitate dialogue amongst city officials. This builds trusted relationships, which in turn ensures that ideas, solutions, lessons, questions, and even friendly competition can flow freely and responsively to cities' needs. Rather than end at a case study or report, C40 Networks create conversations, which enable cities to tailor their own actions to their unique situations, and band together to use their collective power to access partnership resources, including technical and financial support. The result is that cities' climate actions to reduce GHGs and climate risks are bolder, more impactful, implemented faster, at a lower cost and with less resources than if they were to go it alone.

C40 has established a data-driven approach to identify and launch networks, ensuring that resources are strategically deployed to city priorities and focus areas with the greatest potential GHG and climate risk impact. Based on the outcomes of this analysis, C40's efforts are focused into seven overarching initiative areas and associated networks. These are:

- Adaptation and water
- Energy
- Finance and Economic development
- Measurement and planning
- Solid waste management
- Transportation
- Urban planning and development

Currently Bengaluru, Delhi, Jaipur Kolkata, Mumbai are members of the C40.

Source: www.c40.org

SE4All

In September 2011, UN Secretary-General Ban Ki-moon shared his vision for making sustainable energy for all a reality by 2030. He launched Sustainable Energy for All (SE4All) as a global initiative that would mobilize action from all sectors of society in support of three interlinked objectives:

- . Providing universal access to modern energy services.
- . Doubling the global rate of improvement in energy efficiency.
- . Doubling the share of renewable energy in the global energy mix.

Sustainable Energy for All has generated significant momentum since its launch. Governments from 106 countries and the European Union have partnered with SE4All to advance the three objectives on the country level. Over 50 High Impact Opportunities (HIOs) have been identified, with a wide range of stakeholders undertaking actions that will have significant potential to advance Sustainable Energy for All. Governments, the private sector, and multilateral institutions alike are mobilizing resources in support of the initiative's three objectives.

The Danish company Danfoss is a key partner in this initiative.

Source: www.se4all.org

ICLEI

ICLEI- Local governments for Sustainability is the world's leading network for over 1,000 cities, towns and metropolises committed to building a sustainable future.

They impact approx. 20 % of the global population by making cities and regions, sustainable, low-carbon resilient, ecomobile, biodiverse, resource-efficient and productive, healthy and happy with a green economy and smart infrastructure.

Source: www.iclei.org

APPENDIX 6 – LIST OF MOUD EMPANELLED CONSULTANCY FIRMS

Region 1: Bihar, Odisha, West Bengal and Andaman & Nicobar Islands

Rank	Names of Consulting Firms
1	Deloitte Touch Tohmatsu India Private Limited (Deloitte) in association with Urban Management Consultant (UMC) and Hijli Inspiration (Inspiration)
2	Srei Infrastructure Finance Limited in association with Navayuga Spatial Technologies Private Limited RSP Design (India) Consultants Pvt Ltd
3	Alia Consulting Solutions Pvt Ltd. In association with Akanya Development Solution and Genesis Fin tech
4	ArkiTechno Consultants (India) Pvt Ltd in association with IRS Systems South Asia Pvt Ltd
5	The Energy and Resource Institute in association with Tractebel Engineering Avalon Information Systems Pvt Ltd
6	Mahindra Consulting Engineers Limited in association with SUEZ Environment Consulting and Akara Research and Technologies Pvt Limited
7	DDF Consultants Pvt Ltd in association with MSN Infrastructure and Financial Consultant Ltd and SGI Studio Galli Ingegneria Pvt Ltd
8	NCPE Infrastructure India Pvt Ltd
9	Ecorys Nederland BV in association with Ecorys India Pvt Ltd
10	N K Buildcon Pvt Ltd
11	SoftTech Engineers Pvt Ltd in association with Design Point Consult Pvt Ltd

**Region 2: Jammu & Kashmir, Himachal Pradesh, Punjab,
Haryana, Chandigarh and Delhi**

Rank	Names of Consulting Firms
1	AECOM India Pvt Ltd in association with AECOM ASIA COMPANY LIMITED
2	Tandon Urban Solutions Pvt. Ltd. (TUSPL) in association with Spatial Decisions and Maha Infotech Pvt Ltd (MIPL)
3	Arup India Pvt Ltd
4	WAPCOS LTD in association with Yashi Consulting Services Pvt Ltd and Cambridge Systematics Consulting & Technology Private Limited
5	McKinsey and Company Inc.
6	The Energy and Resource Institute in association with Tractebel Engineering SA Belgium and Avalon Information Systems Pvt Ltd
7	All India Institute of Local Self Government
8	Mukesh and Associates in association with VisionRI Connexion Services Private Limited
9	KPMG Advisory Services Pvt Ltd
10	Ecorys Nederland BV in association with Ecorys India Pvt Ltd
11	DRA Consultants Pvt. LTD. in JV with Unity Consultants Pvt. Ltd. and Vanesh Infotech Pvt. Ltd.

Region 3 Uttar Pradesh and Uttrakhand

Rank	Names of Consulting firms
1	PricewaterhouseCoopers Private Limited in association with Rudrabhishek Enterprises Private Ltd. (RPEL) and CPG Consultants Pte Limited
2	ICF Consulting India Pvt Ltd in association with ICF Consulting Services India Pvt and Total Synergy Consulting Pvt Ltd
3	Mars Planning and Engineering Services Pvt Ltd in association with Walls Robert and Todds and UPICO
4	Aarvee Associates Architects Engineering and Consultants Pvt Ltd in association with MARS Telecom Systems Pvt Ltd
5	Engineers India Ltd in association with JPS Associates P Ltd
6	N K Buildcon Pvt Ltd
7	SoftTech Engineers Pvt Ltd in association with Design Point Consult Pvt Ltd
8	Data World Pty Ltd in association with Innovest Advisory Services Pvt Ltd and Caritas Eco Systems Pvt Ltd
9	International City/County Management Association (ICMA) in association with Urban Management Centre (UMC) and Edgesoft India Pvt. Ltd.
10	Dorsh Holding GmbH in association with Dorsh Consult India Pvt Ltd and L R Kadiyali and associates
11	DRA Consultants Pvt. LTD. in JV with Unity Consultants Pvt. Ltd. and Vanesh Infotech Pvt. Ltd. w

Region 4: Madhya Pradesh and Chhattisgarh

Rank	Names of Consulting Firms
1	Haskoning DHV Consulting Pvt Ltd in JV HaskoningDHV Nederland B.V. and Grant Thornton Green Boulevard
2	Dehli Integrated multi model transit system Ltd (DIMTS) in association with Uttarakhand Infrastructure Development Company Limited (U-DEC) and Institute for Spatial Planning and Environmental Research Company (ISPER)
3	Mehta and Associates in JV with Oswal Computers and Consultants Pvt Ltd
4	PricewaterhouseCoopers Private Limited in association with Rudrabhishek Enterprise private Ltd. (RPEL) and CPG Consultants Pte Limited
5	Voyants Solutions Pvt Ltd in association with MINRAJ Consultants
6	Infosys Limited in association with ICLEI- Local Governments for Sustainability South Asia and Administrative Staff College of India
7	WAPCOS LTD in association with Yashi Consulting Services Pvt Ltd and Cambridge Systematics Consulting and Technology Private Limited
8	All India Institute of Local Self Government
9	Pell Frischmann Consultants Ltd in association with Frischmann Prabhu
10	Shah Technical Consultants Pvt. Ltd. (STC)
11	DRA Consultants Pvt. Ltd In JV with Unity Consultants Pvt Ltd and Vanish Infotech Pvt Ltd.

Region 5: Maharashtra and Jharkhand**Rank Names of Consulting Firms**

- | Rank | Names of Consulting Firms |
|-------------|---|
| 1 | CRISIL Risk and Infrastructure Solutions Limited in association with PriMove Infrastructure Development Consultants Pvt. Ltd. And Probity Soft Pvt. Ltd |
| 2 | Delhi Integrated multi model transit system Ltd (DIMTS) in association with Uttarakhand Infrastructure Development Company Limited (U-DEC) and Institute for Spatial Planning and Environmental Company (ISPER) |
| 3 | EPTISA Servicios de Ingenieria, S. L in association with LKS India Pvt Ltd |
| 4 | Knight Frank (India) Pvt Ltd in association with Fortress Infrastructure Services and PSP Financial Consultants Pvt Ltd |
| 5 | Mars Planning and Engineering Services Pvt Ltd in association with Walls Roberts and Todds and UPICO |
| 6 | Alia Consulting Solutions Pvt. Ltd. in association with Spatial Decisions and Maha Infotech Pvt. Ltd. (MIPL) |
| 7 | Tandon Urban Solutions Pvt. Ltd. (TUSPL) in association with Spatial Decisions and Maha Infotech Pvt. Ltd. (MIPL) |
| 8 | Arup India Pvt Ltd |
| 9 | Aarvee Associates Architects Engineers and Consultants Pvt Ltd in association with MARS Telecom Systems Pvt Ltd |
| 10 | Infrastructure Development Corporation (Karnataka) Limited (IDeCK) in association with IDFC Foundation |
| 11 | McKinsey & Company Inc. |

Region 6: Rajasthan, Gujarat, Daman & Diu, Dadar & Nagar Haveli

Rank	Names of Consulting Firms
1	Darashaw & Co. Pvt Ltd in consortium with IDOM Ingenieria y Consultoria S.A.U & FUNDACION CARTIF
2	Lea Associates South Asia Pvt Ltd in association with Crux Consultants Pvt Ltd and VBSOFT Pvt Ltd
3	IIDC Limited in association with Urban Mass Transit Company Limited and Building Design Partnership Limited
4	Egis India Consulting Engineers Pvt. Ltd. in association with IAU idF France and Egis EAU
5	Haskoning DHV Consulting Pvt Ltd in JV with HaskoningDHV Nederland B.V. and Grant Thornton Green Boulevard
6	Deloitte Touche Tohmatsu India Private Limited (Deloitte) in association with Urban Management Consultant (UMC) and Hijli Inspiration (Inspiration)
7	Mott MacDonald Private Limited in association with Mott MacDonald Limited and Ernst and Young LLP
8	Feedback Infra Private Limited in Association with Buro Happold Engineers Pvt. Ltd. and Cisco Systems Services B.V
9	Mehta and Associates in JV with Oswal Computers and Consultants Pvt Ltd
10	ICRA Management Consulting Services in associations with Limited NJS Engineers India Private Limited
11	Jones Lang LaSalle Property Consultants India P Ltd in association with Townland Consultants Pvt Ltd and Tata Consulting Engineering Ltd

Region 7: Tamil Nadu, Kerala, Puducherry, Lakshadweep

Rank	Names of Consulting Firms
1	EPTISA Servicios de Ingenieria, S.L in association with LKS India Pvt Ltd
2	ICRA Management Consulting Services in association with Limited NJS Engineers India Private Limited
3	Jones Lang LaSalle Property Consultants India Ltd in association with Townland Consultants Pvt Ltd and Tata Consulting Engineers
4	CRP Risk Management Limited in association with Infrastructure Management Advisory Services Private Limited
5	Infrastructure Development Corporation (Karnataka) Limited (iDeCK) in association with IDFC Foundation
6	Mahindra Consulting Engineers Limited in association with SUEZ Environment Consulting and Akara Research and Technologies Pvt Limited
7	NCPE Infrastructure India Pvt Ltd
8	Mukesh and Associates in association with VisionRI and Connexion Services Private Limited
9	KPMG Advisory Services Pvt Ltd
10	Pell Frischmann Consultants Ltd in association with Frichmann Prabhu
11	Shah Technical Consultants Pvt. Ltd. (STC)

Region 8: Andhra Pradesh, Telangana, Karnataka and Goa

Rank	Names of Consulting Firms
1	Darashaw & Co Pvt Ltd in consortium with IDOM Ingenieria y Consultoria S.A.U & FUNDACION CARTIF
2	Lea Associates South Asia Pvt Ltd in association with Crux Consultants Pvt Ltd and VBSOFT Pvt Ltd
3	IIDC Limited in association with Urban Mass Transit Company Limited and Building Design Partnership Limited
4	Egis India Consulting Engineers Pvt. Ltd. in association with IAU idF France and Egis EAU
5	CRISIL Risk and Infrastructure Solutions Limited in association with PriMove infrastructure Development Consultants Pvt. Ltd. And Probity Soft Pvt. Ltd
6	Mott MacDonald Private Limited in association with Mott MacDonald Limited and Ernst and Young LLP
7	Srei Infrastructure Finance Limited in association with Navayuga Spatial Technologies Private Limited RSP Design (India) Consultants Pvt Ltd
8	AECOM India Pvt Ltd in association with AECOM ASIA COMPANY LIMITED
9	Knight Frank (India) Pvt Ltd in association with Fortress Infrastructure Services and PSP Financial Consultants Pvt Ltd
10	Infosys Limited in association with ICLEI-Local Governments for Sustainability South Asia and Administrative Staff College of India
11	CRP Risk Management Limited in association with Advisory Services Private Limited

Region 9: Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim

Rank	Names of Consulting firms
1	Feedback Infra Private Limited in Association with Buro Happold Engineers India Pvt. Ltd. And Cisco Systems Services B. V
2	IFC Consulting India Pvt Ltd in association with ICF Consulting Services India Pvt Ltd and Total Synergy Consulting Pvt Ltd
3	Voyants Solutions Pvt Ltd in association with MINRAJ Consultants
4	ArkiTechno Consultants (India) Pvt Ltd in association with IRS Systems South Asia Pvt Ltd
5	DDF Consultants Pvt Ltd in association with MSN Infrastructure and Financial Consultant Ltd and SGI Studio Galli Ingegneria Pvt Ltd
6	Engineers India Ltd in association with JPS Associates P Ltd
7	Data World Pty Ltd in association with Innovest Advisory Services Pvt Ltd and Caritas Eco Systems Pvt Ltd
8	International City/County Management Association (ICMA) in association with Urban Management Centre(UMC) and Edgesoft India Pvt. Ltd
9	Dorsh Holding GmbH in association with Dorsh Consult India Pvt Ltd and L R Kadiyali and associates
10	Pell Frischmann Consultants Ltd in association with Frichmann Prabhu
11	Shah Technical Consultants Pvt. Ltd. (STC)

APPENDIX 7 – SOME FUNDING OPPORTUNITIES

Danish Funds

IFU (Investeringsfonden for Udviklingslande) provides advisory services and risk capital to Danish companies wishing to do business in developing countries and emerging markets. IFU invests on a commercial basis by committing equity capital or by providing loans or guarantees to project companies with Danish investors or a Danish interest. The purpose is to contribute to economic and social development in the host countries and enhance the opportunities of Danish trade and industry in new emerging markets. IFU and IFU-managed funds have co-invested with Danish companies in close to 1,200 companies in more than 100 countries in Africa, Asia, Latin America and parts of Europe. Committed investments total DKK 155 billion of which IFU has contributed nearly DKK 17 billion.

KIF (Klimainvesteringsfonden)

The Danish State, IFU, and a number of institutional investors have established the Danish Climate Investment Fund, which, through commercial investments in developing countries as well as emerging markets, is to contribute to reducing global warming and promote the transfer of Danish climate technology. The current total commitment to the Danish Climate Investment Fund amounts to DKK 1.2 billion. The Danish Climate Investment Fund can invest in all approximately 150 DAC countries. Thus it covers almost all countries in Africa and Latin America, most of the countries in Asia and a few in Europe.

The Danish Climate Investment Fund can invest in projects which, directly or indirectly, contribute to reducing emissions of greenhouse gas, such as:

- Renewable energy, e.g. sun, water and wind
- Sub-supply to renewable energy, e.g. wings for wind turbines and production of solar cells
- Energy efficiency, e.g. upgrading of technology to a 20 per cent improvement as a minimum
- Alternative energy, e.g. biogas from animal husbandry
- Transportation, e.g. public transport
- Material and equipment, e.g. insulation and district heating systems
- Other projects which can contribute to substantial reductions in the emission of greenhouse gas.

Moreover, the Danish Climate Investment Fund can invest in projects, which are destined to adapt to climate changes; such projects could be contingency plans, coastal protection and climatic information. The Danish Climate Investment Fund cannot invest in new energy production based on coal or in projects that are intended for capturing or storing CO₂.

EKF (Export Credit Agency)

An export credit guarantee is insurance against the risks of doing business and investing in other countries. Backed by an export credit guarantee from EKF, a company and its financial institution are assured payment even if the buyer is unable or unwilling to pay. For example, if political conditions in a country prevent completion of the business transaction. EKF provides assistance from the initial contact with a customer abroad until the conclusion of the transaction and receipt of payment. The requirement is that the transaction is basically sound. To that end, EKF assists with credit assessments of the potential customer. Export transactions must also create value for Denmark, for instance by way of jobs and revenue. Whether this is the case is assessed by EKF. Finally, EKF ensures that the transaction is conducted in a socially and environmentally responsible manner. If the overall risk is acceptable, EKF will cover the risk. If everything goes according to plan, the company will complete the transaction as agreed. If something goes wrong, EKF will pick up the tab.

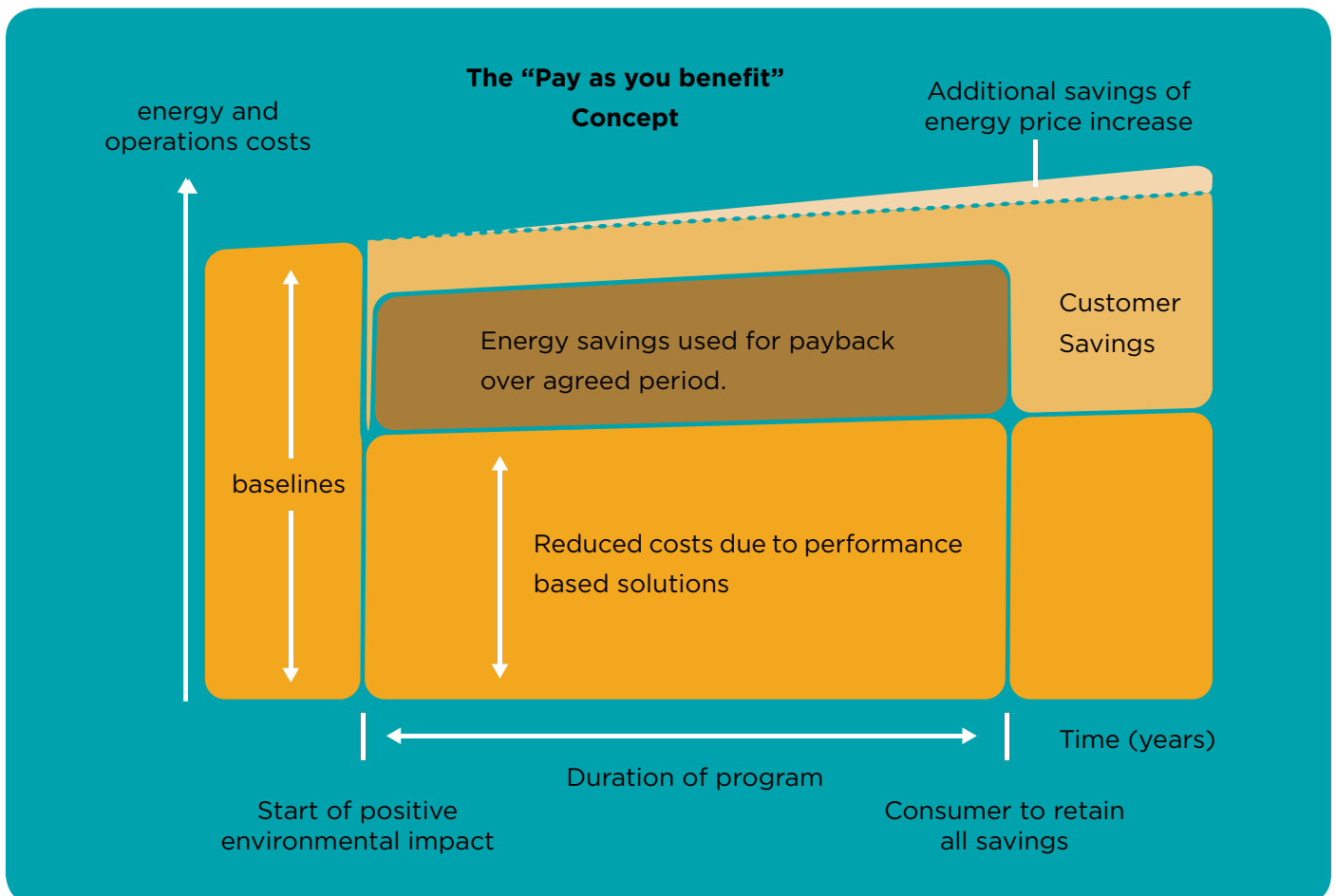
ESCO (Energy Service Company)

An energy service company (ESCO) is a company that provides comprehensive energy solutions to its customers, including auditing, redesigning and implementing changes to the ways the customer consumes energy, the main goal being improved efficiency. Other possible services provided include energy infrastructure outsourcing, energy supply, financing and risk management. It is this comprehensiveness of services that differentiates an ESCO from a common energy company, whose main business is solely providing energy to its customers. Typically compensation to the ESCO is performance-based so that the benefits of improved energy efficiency are shared between the client and the ESCO.

ESCOs often use performance contracting, meaning that if the project does not provide returns on the investment, the ESCO is responsible for paying the difference, thus assuring their clients of the energy and cost savings. Therefore ESCOs are fundamentally different from consulting engineers and equipment contractors: the former are typically paid for their advice, whereas the latter are paid for the equipment, and neither accept any project risk. The risk-free nature of the service the ESCO provides offers convincing incentives for their clients to invest.

Typical characteristics of ESCOs include:

- **Ownership** – ESCOs may be privately-owned companies, either independent or part of a large conglomerate, state-owned, nonprofits, joint ventures, manufacturers or manufacturers' subsidiaries
- **Clients** – ESCOs typically specialise in market niches by sector (industries, utilities, real estate, etc.) and by size (large or small projects)
- **Technology** – Some ESCOs have a technological specialisation (e.g. lighting, HVAC, a particular industrial process), whereas others aim for a holistic approach
- **Project financing** – Financing capabilities vary with the financial situation of the ESCO. Some have large parent companies, which allows them to self-finance projects. However, all ESCOs to some extent rely on third-party financing.



International Funds

IFC (International Finance Corporation)

IFC, a member of the World Bank Group, is the largest global development institution focused exclusively on the private sector in developing countries. IFC utilises and leverages its products and services — as well as products and services of other institutions in the World Bank Group — to provide development solutions customised to meet clients' needs. IFC applies financial resources, technical expertise, global experience, and innovative thinking to help partners overcome financial, operational and political challenges. Clients view IFC as a provider and mobiliser of scarce capital, knowledge and long-term partnerships that can help address critical constraints in areas such as finance, infrastructure, employee skills and the regulatory environment. IFC is also a leading mobiliser of third-party resources for its projects. IFC's willingness to engage in difficult environments and its leadership in crowding-in private finance enables IFC to extend its footprint and have a development impact well beyond its direct resources.

EIB (European Investment Bank)

EIB lending in Asia and Latin America (ALA) started in 1993 and is governed by mandates from the European Union (EU). Under the current ALA mandate, covering the period 2014-2020, the EIB is authorised to lend up to EUR 3.4 billion for operations supporting the EU cooperation strategies and complementing other EU development and cooperation programmes and instruments in these regions. The EUR 3.4 billion regional ceiling is broken down into indicative sub-ceilings of EUR 2.3 billion for Latin America, and EUR 1.1 billion for Asia (including EUR 182m for Central Asia). There are no amounts allocated per country.

The EIB gives priority to the following types of projects:

- Climate change mitigation and adaptation (e.g. renewable energy, energy efficiency, urban transport and other projects that reduce CO2 emissions)
- Development of social and economic infrastructure, including water and sanitation
- Local private sector development, in particular support to SMEs.

In addition, to be eligible for financing, projects are required to have good potential to contribute to the economic development of the beneficiary country.

Projects with a total investment above EUR 25 million can be financed either directly to a project promoter or indirectly through a government or financial intermediary. Project promoters are required simply to provide the Bank's Operations Directorate with a detailed description of their capital investment together with the prospective financing arrangements. The total investment of a typical project under the ALA 2014-2020 mandate is above EUR 40 million.

For smaller projects, EIB can provide credit lines to selected financial institutions, which then on-lend the funds mainly to small and medium-sized enterprises (SMEs). The financial institutions assess each project, assume the credit risk and set the loan conditions for the final beneficiary according to criteria agreed with the EIB. Interested promoters of such projects should contact the banks and intermediaries directly.

GCF (Green Climate Fund)

The Green Climate Fund will finance projects and programmes in the public and the private sectors that contribute towards achieving at least one of the eight strategic impacts of the Fund. Access to GCF resources to undertake climate change projects and programmes is possible for accredited national, regional and international entities. Accredited Entities (AEs) can submit funding proposals to the Fund at any time. To ensure country ownership, the Fund's Board will consider only those funding proposals which are submitted with a formal letter of no-objection in accordance with the Fund's initial no-objection procedure. An AE or an executing entity (i.e. project or programme sponsor) may submit a concept note for feedback and recommendations from the Fund, in consultation with the National Designated Authority or Focal Point. The recommendation will clarify whether the concept is endorsed, not endorsed with a possibility of resubmission, or rejected.

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