ANDHRA PRADESH

India’s Sunrise State

October 2018
Introduction
Indian Economic Outlook: Robust Macroeconomic Fundamentals

India rated as the fastest growing global economy since 2014 - sustained GDP growth >7%, higher than Emerging economies (4.6%), Advanced economies (1.8%)

- 3rd Largest Economy (PPP): USD 10.38 trillion
- 6th Largest Economy (nominal): USD 2.85 trillion
- 1st Among world’s largest and fastest growing economies
- 1st Among 100 countries on Growth, Innovation and Leadership index*
- 1st Youngest population
- 2nd Largest English Speaking nation
- 2nd Cumulative Foreign Direct Investment (FDI) in India
- 2nd Foreign Direct Investment (FDI) in India

GDP Growth Projections (%)

Foreign Direct Investment (FDI) in India

Source: IMF

Source: India Brand Equity Foundation

Cumulative Foreign Direct Investment (FDI) (in USD Bn)
Andhra Pradesh leads the country in growth, development, economic stability, investor friendliness and ease of doing business.

- **4%** of India’s population
- 50+ Mn population
- **8th** largest state of India with
- 13% of India’s coastline, 974 Kms, second longest in India
- **Fastest growing** state in India
- USD 124 Bn GSDP FY 17-18
- Growing @11.22%, consistently higher than national average
- **6 Active Ports, 8 ports** being developed
- India’s Gateway to the east
- **12 airports** being developed (6 operational)
- >10% growth across agriculture, manufacturing & services sector
- 29 SEZ’s, 278 Industrial Estates, 16 smart cities & economic zones
- #1 in attracting **Investments**
- Excellent Road (46,000 kms) and Rail network (at the cross roads of North-South and East-West corridor)
Andhra Pradesh, fastest growing State in India and Ranks No 1 is Ease of Doing Business and attracting Private Investments

Poised for Consistent Double Digit Growth
Andhra Pradesh’s Economy is expected to grow at a CAGR of over 12% over the next two decades

Growing at 11.22% (constant price)
Andhra Pradesh’s economy growth was higher than the national average (6.6%) by over 4.6%

Business Friendly Policies
To complement sustained economic growth, the state has conceived a proactive investor friendly regime.
Urbanisation has been identified as Key Growth Engine of Economic Growth and Socio Economic Development of the State

- Urbanisation to go up from 30% in 2011 to 50% by 2029
- To continue with the double digit economic growth requires structured urban growth and development
- Urban Contribution to GSDP is expected to touch 75%
- Total Investment opportunity of about USD 30 Bn in Urban Development

### Investment Landscape in the State – Identified Projects (~USD 18 Bn)

- **Urban Infra**
  - Rs 120 Bn (USD 1,700 Mn) - Projects in water supply, sewerage, transport, renewables, etc

- **Smart Cities**
  - Rs 125 Bn (USD 1,785 Mn) - Central and State Smart Cities currently under development, two under Swiss challenge

- **Economic Cities**
  - Rs 250 Bn (3,570 Mn) - 7 Economic Cities proposals under implementation, new Economic Cities to be launched

- **Amaravati Capital City**
  - Rs 482 Bn (USD 6,885 Mn) - greenfield capital city under development, opportunities to invest in funding/PPP opportunities

- **Others**
  - Rs 140 Bn (USD 2,000 Mn) - in urban transport, metro, transport hubs, etc

### Investment in Urban Infrastructure (2016-2029) ~ USD 30Bn

Source: Urban Development Sector Paper
Amaravati is envisioned to be one of the “Happiest cities” encompassing the highest standards of liveability and infrastructure with a thriving economic environment.

**VISION**

- 8,603 km² Capital Region Area
- 217 km² Capital City Area
- 3.5 Mn Population - 2050
- USD 35 Bn GDP - 2050
- 1.5 Mn Employment - 2050
- 9 Cities
- 27 Townships
- 100+ Parks
- 80% Public Transportation
- 189 km Ring road
- 80 km Inland canals
Amaravati – currently in fast paced execution mode

**Land**
- 90% of overall project area under possession
- 27,956 farmers pooled in 33,920 acres under Land Pooling Scheme

**Design**
- IGBC Platinum rated Infrastructure designs
- Architectural designs for Assembly, High Court and Secretariat completed

**Economic development**
- Master developer for start-up area
- Private universities – VIT, Amrita, SRM & 4 others allotted
- Social infra – 10 schools, 5 hospitals, 8 hotels

**Planning**
- Amaravati masterplan for a population of 3.5 Mn
- Infrastructure masterplan for 35 years
- Socio-economic masterplan to create a USD 35 Bn economy in 35 years

**Construction**
- 90% of USD 8 Bn project works tendered out; USD 4 Bn under execution
- Transit government complex of 0.6 Mn sq.ft completed in 7 months
- 30 Mn sq.ft. of built-up area under construction
Amaravati – People Centric Smart City Plan

- USD 35 Bn GDP by 2050
- 3,200 km+ of cycle tracks
- 80% Public transportation
- 80 km inland canals
- Fully underground integrated utility corridors
- All required social infrastructure within 10 minutes’ walk
- 30% Blue-green space in city
- 100+ Parks in neighborhood
- Walk to work, within 15 minutes using public transport
- Smart Infrastructure – Integrated Command/Control center
- Population 3.5 Mn by 2050 (1.5 Mn jobs)
Amaravati – Funding Requirement

Capex Rs 482 Bn / USD 6,885 Mn

- Government complex buildings: USD 1,943 Mn
- Trunk Infrastructure: USD 2,828 Mn
- Tier - II infrastructure: USD 2,114 Mn

Funding sources:
- Short term 62%
- Medium term 4%
- Long term 13%
- Equity / grants 21%

Levers of financing:
1. Refinance to long term financing instruments
2. Monetization of land available with city
3. Build strong tax base and cash flow for city
Key Institutions driving Sustainable Growth

**Government of Andhra Pradesh**

**Municipal Administration & Urban Development Department**

- **Andhra Pradesh Capital Region Development Authority (APCRDA)**
  - CRDA Act was passed to provide a legislative framework/institutional support for the development
  - CRDA is headed/chaired by the Hon’ble CM
  - Responsible for planning, development & regulation
  - Dynamic team with multiple private sector executives put up to lead the efforts

- **Amaravati Development Corporation (ADC)**

- **Andhra Pradesh Urban Infrastructure Asset Management Ltd (APUIAML)**
  - APUIAMl is a joint venture of Government of Andhra Pradesh focused on Urban Infrastructure
  - APUIAMl focuses on end-to-end delivery of projects including project development, financing and project implementation
  - Structure projects to be bankable, reduce operating losses and contribution by Government/ULB
  - Comprehensive asset management program for each project
## Foreign Direct Investment

The Department of Industrial Policy & Promotion is the nodal Department for formulation of the policy of the Government on Foreign Direct Investment. The FDI policy contains the % of FDI allowed in each industry. For city and regional level infrastructure, 100% FDI is allowed in automatic route.

## APIDE Act

Private Sector Participant submits an unsolicited or Suo-Motu proposal for undertaking a Project that is not already initiated by the Government Agency. Competitive counter proposals shall be invited from other participants. If the counter proposal is found to be attractive, the Original Project Proponent will be given the opportunity to match the competing counter proposal.

Innovative procurement: The Swiss Challenge Mechanism in Andhra Pradesh is governed by ‘Andhra Pradesh Infrastructure Development Enabling Act, 2001’

## MA&UD Dept., GoAP

Municipal Administration and Urban Development Department in the Govt. of AP is the nodal department to undertake Urban Infrastructure Projects in the state of Andhra Pradesh and spearheading smart cities, major urban infrastructure projects and Amaravati.

## I&I Dept., GoAP

Infrastructure & Investment Department in Govt. of Andhra Pradesh is key agency for development of core infrastructure projects including Energy, Airports, Ports and others.

## APCRDA Act

The APCRDA Act 2014 is enacted for the purposes of planning, coordination, execution, financing, promoting and securing the planned development of the Capital Region Development Area including the construction of the new capital for the state of Andhra Pradesh and for managing and supervising urban services in the new capital area and for matters ancillary thereto.

## Smart City

The Smart Cities Mission is an innovative and new initiative by the Government of India to drive economic growth and improve the quality of life of people by enabling local development and harnessing technology as a means to create smart outcomes for citizens.

## Key Initiatives

- Introduction of PPP component in new metro policy
- Amendment in the Arbitration and Conciliation Act, 1996 to make dispute resolution more cost effective and time-bound
35% renewable energy use across the city

Use of Smart-meters to provide consumption analytics

To promote and enable the use of Electric vehicles

Distributed RE generation within the city
*(Net metering, community solar generation, PV shaded streets, etc)*

100% underground cabling, minimizing unauthorized connections

Smart Grids to ensure efficient and reliable operations
## Projected Progressive Power Demand in Amaravati

<table>
<thead>
<tr>
<th>Duration</th>
<th>Population in Mn</th>
<th>Power Demand MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017-2020</td>
<td>0.4</td>
<td>327</td>
</tr>
<tr>
<td>2020-2025</td>
<td>0.8</td>
<td>680</td>
</tr>
<tr>
<td>2025-2030</td>
<td>1.2</td>
<td>929</td>
</tr>
<tr>
<td>2030-2035</td>
<td>1.7</td>
<td>1300</td>
</tr>
<tr>
<td>2035-2040</td>
<td>2.5</td>
<td>1958</td>
</tr>
<tr>
<td>2040-2045</td>
<td>3.2</td>
<td>2466</td>
</tr>
<tr>
<td>2045-2050</td>
<td>3.5</td>
<td>2706</td>
</tr>
</tbody>
</table>
The distribution company will have to draw power from the transmission lines in the city.

Power Master Plan – T&D infrastructure

<table>
<thead>
<tr>
<th>Power infra</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>400/220 KV Stations</td>
<td>03</td>
</tr>
<tr>
<td>220/33 KV Stations</td>
<td>17</td>
</tr>
<tr>
<td>33 KV Stations (Switching Stations)</td>
<td>165</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>185</strong></td>
</tr>
</tbody>
</table>
Power ducts have been laid in all of roads

- Amaravati’s road network consist of approx. 1600kms

For all of the 1600km network, power “ducts” are being constructed under the roads for a cost of INR 2355 Crores (USD 330 Mn)

Construction of ducts estimated to be completed by Dec-19

These ducts can be provided to distribution company by APCRDA on agreed terms of use
### Project cost

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Component</th>
<th>Function</th>
<th>Cost in INR Crores</th>
<th>Cost in USD Mn</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MV Switching stations</td>
<td>Power distribution – primary</td>
<td>1504</td>
<td>215</td>
</tr>
<tr>
<td>2</td>
<td>Secondary equipment including RMUs/CSS/Feeder pillars etc</td>
<td>Power distribution - secondary</td>
<td>1079</td>
<td>154</td>
</tr>
<tr>
<td>3</td>
<td>33 kV power cables – distribution</td>
<td>Power distribution – network</td>
<td>1453</td>
<td>208</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td><strong>4,036</strong></td>
<td><strong>577</strong></td>
</tr>
</tbody>
</table>

- The actual capital expenditure may be phased in-line with development
- Ducts will reduce capex requirement; ease installation

### Scope of concessionaire

1. Financing of CapEx to meet defined infrastructure roll-out and operational requirements
2. Set up smart distribution network from city boundaries to end-user connectivity
3. Procurement of power from state / external sources at minimum cost
4. Operation of supply and distribution network, supply to consumers, EV charging infrastructure
5. Billing and collection from consumers
Regulatory environment in India

- Responsible for enforcing Electricity Act
- Promotes competition, investments and efficiency in sector, and advises governance to protect the interests of consumers.

Central Electricity Regulatory Commission
- Central agency for policy formulation in the sector
- Creates national tariff policy and national electricity policy on periodic basis

State Electricity Regulatory Commission
- Regulates state rules on electricity
- Responsible for licensing, tariff fixation and dispute resolution

Distribution licensee
- Responsible for supply of power, billing and collection
- Also authorized to generate and/or purchase power in most cases

Transmission licensee
- Responsible for intra state transmission of power
- In case of AP, also responsible for bulk procurement of power for the state
### Key terms of distribution

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Condition</th>
</tr>
</thead>
</table>
| **Mode of development**          | Design-Build-Finance-Operate-Transfer (DBFOT)  
                                 | Exclusive distribution license in Amaravati on DBFOT basis; investment in distribution infrastructure based on city growth to ensure 24X7 power supply |
| **Selection of developer**      | Through competitive bidding; to be completed by March 2019                                                                                 |
| **Concession period**            | 20 – 25 years                                                                                                                               |
| **Tariff structure**             | As set by AP Electricity Regulatory Commission                                                                                              |
| **Renewable Power Obligation**   | 10% in 2 years scaling up to 35% in 10 years  
                                 | Generation within city encouraged                                                                                                             |
| **Power procurement**            | Bulk power to be provided by APGENCO / APTRANSCO; renewable power to be obtained from private developers or by setting up RE generating stations |
| **Contract Structure**           | Historically had guaranteed ROE with bidding based on AT&C loss trajectory; however, need new structures for Amaravati as development is greenfield  
<pre><code>                             | Consider bidding based on – fixed ROE, distribution margin or bulk purchase cost                                                                |
</code></pre>
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Fixed Return on equity model</th>
<th>Distribution margin model</th>
<th>Bulk energy model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bid parameter</strong></td>
<td>• Return on equity invested by developer; expected RoE of 14 – 16%</td>
<td>• Margin per unit sold over cost of supply</td>
<td>• Cost of bulk energy per unit to be paid to APTRANSCO/APGENCO</td>
</tr>
<tr>
<td><strong>Mechanism</strong></td>
<td>• Developer to meet SLAs as specified in concession agreement including AT&amp;C losses</td>
<td>• Distribution margin over the cost of supply to be set as average tariff by ERC</td>
<td>• Cost of power purchase fixed and benchmarked to current tariff</td>
</tr>
<tr>
<td></td>
<td>• ERC to preapprove and review investments for true up of annual tariff</td>
<td>• Decreasing margins for increasing consumption can be enforced</td>
<td>• However, renewable power for meeting RPO to be purchased from external market or generated by installing RE capacity</td>
</tr>
<tr>
<td><strong>Mitigation of demand and power cost risk</strong></td>
<td>• Demand risk mitigated as returns not dependent on quantum of power sold; investments shall be based on demand to be catered</td>
<td>• Demand risk exists but can be mitigated by providing minimum offtake</td>
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</tr>
<tr>
<td></td>
<td>• Power cost risk mitigated as tariff shall be a pass through</td>
<td>• Increased solar adoption by households / commercial buildings may reduce demand; can be mitigated by having community solar model</td>
<td>• Uncertainty on cost per unit associated with RE generation; however, current trends suggest decreasing RE costs</td>
</tr>
<tr>
<td><strong>Advantages of the model</strong></td>
<td>• Limited risks will lead to aggressive bidding by developers</td>
<td>• Reasonable tariff for consumers as developer returns will be back-loaded</td>
<td>• Reasonable tariff for consumers and dependent on market costs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Investment in mechanisms for demand creation is incentivized</td>
<td>• Encourage investment in renewables and RE integration</td>
</tr>
<tr>
<td><strong>Disadvantages of the model</strong></td>
<td>• Innovative and high-cost technology investments may be minimized</td>
<td>• May require significant government contribution for offtake guarantees</td>
<td>• May require significant government contribution for offtake guarantees</td>
</tr>
<tr>
<td></td>
<td>• High consumer tariff in initial years; requires back-loading of ROE</td>
<td></td>
<td>• May discourage distributed generation as it is more expensive and cost is to developers account</td>
</tr>
</tbody>
</table>

APTRANSCO – Transmission co. of AP; APGENCO – Generation co of AP
1. APCRDA has invested Rs. 2355 Cr (USD336m) on developing the power duct length of **16,852 km**

2. The infrastructure is financed through a mixture of short-term and long-term debt, **backed by Government guarantee**

**Proposals**

1. APCRDA to provide lease rental schedule, which will be added to tariffs
   - Lease to be calculated for 25 year period

2. APCRDA to have equity in the SPV commensurate to the equity invested in the power duct project
   - Government guarantee backed debt to be transferred
   - APCRDA to receive RoE equal to that of private developer

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of network</td>
<td>1320 km</td>
</tr>
<tr>
<td>Duct length</td>
<td>16852 km</td>
</tr>
<tr>
<td>Cost of power ducts</td>
<td>INR 2355 Cr (USD336m)</td>
</tr>
<tr>
<td>Equity component of project</td>
<td>INR 235 Cr (USD33.6m)</td>
</tr>
</tbody>
</table>
1. In a fashion similar to Power ducts, ICT ducts have also been constructed by APCRDA

2. Synergies in bundling power and ICT distribution under same agency would be include:
   1. Simultaneous installation for buildings / households
   2. Common resource utilization for installation
   3. Setting up of wired Advanced Metering Infrastructure (AMI)

3. The ICT cable could be further sub-leased to an ISP provider to augment revenues
Agencies involved in Amaravati’s power distribution

Andhra Pradesh Capital Region Development Authority (APCRDA)
• Set up through APCRDA Act, 2014
• Nodal agency for development of capital city (217 sq.km) including land procurement, planning, design, financing and economic development of capital city
• Urban development authority responsible for planning of capital region (8,603 sq.km)

Transmission Corporation of Andhra Pradesh (APTRANSCO)
• Transmission licensee owned by Government of Andhra Pradesh
• Responsible for transmission of power to various distribution companies in the state
• Also responsible for bulk procurement of power

Andhra Pradesh Southern Power Distribution Company Ltd (APSPDCL)
• Current licensee for power distribution in eight districts (out of 13) of Andhra Pradesh; incumbent licensee in Amaravati region

Andhra Pradesh Generation Company (APGENCO)
• State generation agency for power generation
• 4559.6 MW comprising 2810 MW Thermal, 1747.6 MW Hydro and 2 MW Wind power stations
## Smart Pole - Need and purpose

### Features
- **Multiple sensors**
- **Energy-saving**
- **Cameras**
- **Billboards**
- **Electric mobility management**
- **Multiple chargers**
- **Hot spot**
- **WiFi**

### Benefits

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>60% reduction in lighting cots</strong></td>
<td>Improved citizen safety with better lighting facility &amp; surveillance</td>
</tr>
<tr>
<td><strong>Safe traffic due to increased visibility of hazards</strong></td>
<td>Boost network in densely populated areas</td>
</tr>
<tr>
<td><strong>Calculate key environmental parameters</strong></td>
<td>Assist EV with on-road charge points</td>
</tr>
<tr>
<td><strong>Increase net penetration by WiFi availability across city</strong></td>
<td>Lower crime rates</td>
</tr>
</tbody>
</table>

- **Boost network in densely populated areas**
- **Assist EV with on-road charge points**
- **Calculate key environmental parameters**
- **Increase net penetration by WiFi availability across city**
- **60% reduction in lighting cots**
- **Safe traffic due to increased visibility of hazards**
- **Improved citizen safety with better lighting facility & surveillance**
## Components of Lighting and Smart Poles with respective range of service

<table>
<thead>
<tr>
<th>Components</th>
<th>Range</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED Lighting</td>
<td>30 meters</td>
<td>1 on each pole</td>
</tr>
<tr>
<td>Digital Advertisement Board</td>
<td>180 meters</td>
<td>1 in 6 poles</td>
</tr>
<tr>
<td>Surveillance Camera</td>
<td>180 meters</td>
<td>1 in 6 poles</td>
</tr>
<tr>
<td>Speaker + amplifier</td>
<td>180 meters</td>
<td>1 in 6 poles</td>
</tr>
<tr>
<td>Emergency call box</td>
<td>500 meters</td>
<td>1 in 18 poles</td>
</tr>
<tr>
<td>Environmental sensor</td>
<td>1 on every junction; 1 in every densely populated area;</td>
<td>~230 in city</td>
</tr>
<tr>
<td>Mobile Charging Port</td>
<td>500 meters</td>
<td>1 in 18 poles</td>
</tr>
<tr>
<td>EV charging point</td>
<td>1 per sqkm</td>
<td>~220 in city</td>
</tr>
<tr>
<td>WiFi Router (2.4 Ghz)</td>
<td>180 meters</td>
<td>1 in 6 poles</td>
</tr>
<tr>
<td>Solar panel</td>
<td>180 meters</td>
<td>1 in 6 poles</td>
</tr>
<tr>
<td>Small Cell (cluster of 4)</td>
<td>180 meters</td>
<td>1 in 6 poles</td>
</tr>
<tr>
<td>Parking meter / Public Bike sharing meter</td>
<td>180 meters</td>
<td>1 in 6 poles</td>
</tr>
</tbody>
</table>
Cross section and types of roads - length & design

Neighborhood roads ~1300 kms
1. Poles on either side in staggered fashion
2. Smart pole to be interlinked with a parking slot for EV / on-street parking
3. Multi-function zone provides platform to link Public bike sharing systems, benches to utilize WiFi, etc

City major roads ~300 kms
1. Pole only on median
2. Facilities such as CCTVs doubled; required for monitoring either side
3. Citizen facilities not provided
## Phase-wise roll out

<table>
<thead>
<tr>
<th>Components of pole</th>
<th>Phase 0 Lighting pole</th>
<th>Phase I &quot;City essential&quot; Smart Pole</th>
<th>Phase II Pole as a Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pole, LED lighting, Panel for ad,</td>
<td>Digital billboard, CCTV, SOS Call box, Env. Sensors, speaker</td>
<td>WiFi router, EV charging, Mobile charging, 5G Small cell, Parking meters</td>
</tr>
<tr>
<td>Average cost per pole</td>
<td>1.43 Lakhs/pole (USD20,428)</td>
<td>15.75 Lakhs/pole (USD225,000)</td>
<td>(all Ph-I poles to have provision; equipment provided by service provider)</td>
</tr>
<tr>
<td>Number of units</td>
<td>88,890</td>
<td>15,758</td>
<td>15,758</td>
</tr>
<tr>
<td>Revenue streams possible</td>
<td>• Lighting services • Panel advertisements</td>
<td>• Digital advertisement revenue</td>
<td>• Lease rentals from services</td>
</tr>
<tr>
<td>Installation</td>
<td>In 3-4 months</td>
<td>Zone-wise deployment; completion in 3 years</td>
<td>Flexibility provided to bidder</td>
</tr>
<tr>
<td>Total cost</td>
<td>Rs. 1272 Crores USD 182 Mn</td>
<td>Rs. 2485 Crores USD 355 Mn</td>
<td>-</td>
</tr>
</tbody>
</table>

**Total cost**

Rs. 3757 Crores (USD 537 Mn)
## Terms of concession

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Condition</th>
</tr>
</thead>
</table>
| **Mode of development**    | **Design-Build-Finance-Operate-Transfer (DBFOT)**  
Develop Lighting and Smart poles in city; Operate for concession period; collect lighting charges as per tariff and lease rentals on behalf of city |
| **Selection of developer** | Through competitive bidding planned by Feb-19 (commission by Jun-19)                                                                      |
| **Concession period**      | 10 – 15 years                                                                                                                              |
| **Revenue streams**        | **Lighting services**  
**Advertisement revenue**  
**Lease rental from services** |
| **Risk**                   | Tariff to be provided based on CapEx + OpEx of a regular lighting pole (excluding any smart optimization)  
- Demand risk  
- Uncertainty in price of ads  
- Demand risk |
| **Mitigation**             | Minimum usage guarantee  
No other advertising on pole allowed on streets (bus stops excluded)                                                                         |
| **Bidding criteria**       | **Options:**  
1. Lowest Viability Gap Funding (VGF) to be paid upfront given fixed revenue share  
2. Highest Revenue share, given a fixed VGF per pole  
3. Lowest assured revenue payable every year; fixed revenue share beyond assured revenue |
Amaravati Smart & Sustainable City Corporation Ltd.

Govt. of Andhra Pradesh  
APCRDA  

50%  50%

ASSCCL

External service provider on pole

Revenue share

VGF

Smart pole provider

- Revenues for lighting from city budget
- Advertisement regulation
Other Key Projects under APCRDA

Infrastructure for Amaravati Government Complex

<table>
<thead>
<tr>
<th>Infrastructure</th>
<th>Rs Mn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads</td>
<td>2,277.5</td>
</tr>
<tr>
<td>Bridges</td>
<td>2,675.4</td>
</tr>
<tr>
<td>Storm Water Drains</td>
<td>1,163.2</td>
</tr>
<tr>
<td>Water Supply</td>
<td>203.0</td>
</tr>
<tr>
<td>Waste Water</td>
<td>390.0</td>
</tr>
<tr>
<td>Power &amp; ICT</td>
<td>1,349.7</td>
</tr>
<tr>
<td>Reuse Water</td>
<td>47.2</td>
</tr>
<tr>
<td>Artificial Water Channel, Pump House &amp; WTP</td>
<td>1,840.1</td>
</tr>
<tr>
<td>Investigation &amp; Design</td>
<td>83.1</td>
</tr>
<tr>
<td><strong>Total (USD 143 Mn)</strong></td>
<td><strong>10,029.2</strong></td>
</tr>
</tbody>
</table>

It is proposed to undertake the development of the Amaravati Government complex infrastructure under a Hybrid-annuity model. Under this model, the developer would be paid 51% of the project cost in line with the construction progress, whereas the remaining 49% would be paid in annuity over the concession period.

The utility charges collected from the occupants of the Government complex would be escrowed to service the annuity required to be paid and would be backed by the State Government’s guarantee.

Amaravati BRTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Numbers</th>
<th>Rs Mn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Buses</td>
<td>150</td>
<td>4,500</td>
</tr>
<tr>
<td>Bus stops</td>
<td>320</td>
<td>640</td>
</tr>
<tr>
<td>Passenger Information systems + Ticketing system</td>
<td>-</td>
<td>1,000</td>
</tr>
<tr>
<td>Bus terminals</td>
<td>3</td>
<td>1,500</td>
</tr>
<tr>
<td><strong>Total (USD 110 Mn)</strong></td>
<td><strong>7,640</strong></td>
<td></td>
</tr>
</tbody>
</table>

A 285km network of major roads along with 1300 km of neighborhoods are in various phases of development in the city. A 80km BRTS network is planned from within these roads.
Eluru Smart City
Government of Andhra Pradesh framework for Smart Cities

Smart City Vision
Economic Development, Infrastructure, Employment, Happiness

1. To promote Integrated Infrastructure Development for its cities through selection of consortium

2. To promote Pan City Development

3. Life Cycle Approach for the Project

4. The Financing Plan shall include internal & external sources for capital investments and O & M over the lifecycle of the project (10-15 years) by Hybrid Annuity Model

- Four cities namely Tirupati, Kakinada, Visakhapatnam & Amaravati selected under GoI Smart City Programme
- Govt. of Andhra Pradesh envisages to develop additional 13 smart cities (its major Municipal Corporations) – Six cities being developed in Phase 1
- Government has appointed APUIAML as the end to end service provider to the 6 State Smart City SPVs
Eluru Smart City – integrated approach to Smart City development

• Given complexities of achieving urban transformation objectives of the Smart City initiatives, GoAP realized that there is a need for implementation of integrated city infrastructure projects

• This is possible through selection of a consortium capable of rendering the full range of services for comprehensive & holistic development of the City

• As per Hybrid Annuity Model (HAM), the Government will fund a portion of the capex and Private party will contribute the balance of the project cost during the construction period. The payment as contributed by the Private party will be made over a period of 10-15 years as semi-annual instalments and may be equal annuity payments or telescopic annuity payments

• Government, has accorded permission to Eluru Municipal Corporation (‘EMC’) to adopt the Swiss Challenge Approach for selection of the developer for Eluru Smart City

• Eluru Smart City Corporation Ltd. (‘ESCCL’) is the SPV formed for the project and is 50% owned by GoAP and 50% by EMC

• Shapoorji Pallonji, one of India’s leading infrastructure developer along with its partners Siemens, Bosch, Webag and others submitted a suo-moto proposal for integrated development of Eluru as a Smart City under Hybrid Annuity Model (‘HAM’)

Projects Identification through Citizen Engagement
Eluru Smart City – Project Components

**Road Improvement – Rs. 49.03 Cr**
- 10 roads – 9.4 Km
- Width of 10 to 18m

**Flood Management – Rs. 90.86 Cr**
- 37 Km (approx) of Storm Water Drains in low lying, high risk areas

**Smart Water Management – Rs. 15.49 Cr**
- SCADA Monitoring of 21 RTU Transmission Lines, 29 RTU Distribution Lines, 1 Water Treatment Plant, 3 Pumping Stations and 23 Elevated Supply Reservoirs

**Junction Improvement – Rs. 9.85 Cr**
- 19 junctions in the city

**Smart Grid and Energy Management – Rs. 221.55 Cr**
- UG cables – 84 Km; 6 substations; 1 backup substation
- 142 RMU and Transmission Lines

**Sewage Treatment Plant – Rs. 71.35 Cr**
- 4 decentralised STP; 40 MLD cumulative capacity

**Canal Improvement ~2 km with Iconic Structure**

**Intelligent Traffic Management; Safety and Security; CCC System - Rs. 41.54 Cr**
- Monitoring at 19 junctions (Face recognition, Red light violation, speed monitoring, real time display signboards)

**Sewerage System – Rs. 207.25 Cr**
- 170 Kms (apprx); Individual household connectivity
Eluru Smart City– Capital Expenditure

- Proposals for Junction Improvement, Intelligent Traffic Management, Safety and Security
- Proposals for Outdoor to Indoor Substation and Upgradation of Power Transformers
- Proposals for Smart STP Interventions
- Flood Management
- Proposals for Road Widening
- Proposals for Combined intervention for Road Widening and Smart Grid
- Proposals for Road Widening
- Proposals for Raised Crossovers, Neck downs and Curb Extensions
- Proposals for Raised Intersections, Traffic Islands
Eluru Smart City – Implementation Structure & Development Terms

A SPV shall be incorporated under the laws of India by the selected bidder for the purpose of the project.

Concessionaire

 ESCCL

GoAP

EMC

Implementation and Operation & Maintenance of the project components

Equity/Grant

Equity

Performance based Payments

Concession Period of 12 years from Financial Closure (2 years of construction + 10 years of O & M) under HAM

- 35% of capex by ESCCL and rest 65% arranged by Concessionaire during the Construction Period
- Annuity Payments - 20 bi-annual telescopic payments over the Operation Period along with interest towards 65% contribution made by Concessionaire

Design

Finance

Construct

Maintain

Total Project Cost
Rs 12,330 Mn (USD 165 Mn)

Capital Expenditure ~ Rs 8,900 Mn (USD 120 Mn)
Operation & Maintenance (Life Cycle) – Rs 3,430 Mn (USD 45 Mn)
## Eluru Smart City – Time Line for the Project

<table>
<thead>
<tr>
<th>Pre –Development Phase</th>
<th>Development Phase</th>
<th>Construction Phase</th>
<th>O&amp;M Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citizen Engagement/ Stakeholder Consultation</td>
<td>Detailed Designs</td>
<td>Start of Project Implementation</td>
<td>Operation and Maintenance over a period of 10 year for each project element</td>
</tr>
<tr>
<td>Smart City Plan</td>
<td>Technical Closure</td>
<td>Construction &amp; Implementation over a period of 2 years for all the project elements</td>
<td></td>
</tr>
<tr>
<td>Engineering Designs</td>
<td>Financial Closure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Structuring</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial Modelling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proposal from Developer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tender and Award</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To be completed by Nov 2018

Dec 2018 – Mar 2018

April 2018 – March 2020

Post COD, 10 Years
## Eluru Smart City – Key Performance Indicators

<table>
<thead>
<tr>
<th>#</th>
<th>Proposed Intervention</th>
<th>Key Performance Indicator</th>
<th>Proposed Value for Benchmarking</th>
</tr>
</thead>
</table>
| A | Intelligent Traffic Management, Safety and Security | 1. Capturing of all Red Light and Zebra Crossing Violations on Real Time Basis  
2. Data Storage and Archiving  
3. Reduction in Travel Time  
4. Capturing Suspects in Police Database  
5. Real time monitoring of Environmental Parameters, Air Quality, and Temperature as per CPCB Norms | 98%  
99%  
8-10%  
95%  
98% |
| B | Smart Grid & Energy Management | 6. SMART Metering & Recording  
7. System up time/ Substation power availability  
8. SCADA & MDM  
9. Reporting of any status changes / alarms in the electrical network, sending out control command to a circuit breaker  
10. Identification of switching sequence for fault restoration  
11. Data Availability Requirement for Advanced Metering Infrastructure (AMI) communication network | 99%  
99.5%  
> 99.5%  
5 Seconds  
With in 5 seconds  
Hourly – 95%  
Daily – 98%  
Monthly – 99% |
| C | Automation of Water Supply System | 12. Identification & Pinpointing of new leakages in the Water Transmission network  
13. 99% of Automation System  
14. Improved Plant Availability with minimum downtime  
15. 100% Data Availability at Main Control | 98% Accuracy and pinpointing of leak location with an accuracy of +/- 200 m |
| D | Sewerage System | 16. Coverage of Sewer Network Services  
17. Quality of Treatment | 100% |
| E | Storm Water Management | 18. Coverage of Storm Water Drains | 100% |
Eluru Smart City – Transforming Eluru

<table>
<thead>
<tr>
<th>Rationale</th>
<th>Metric/s</th>
<th>Current value</th>
<th>Proposed value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving water network efficiency</td>
<td>Non Revenue Water</td>
<td>55%</td>
<td>20%</td>
</tr>
<tr>
<td>Reducing technical losses from the grid</td>
<td>ATC losses (^1) (%)</td>
<td>4.43%</td>
<td>3.63%</td>
</tr>
<tr>
<td>Reducing grid downtime</td>
<td>SAIDI (^2) (min./year)</td>
<td>5,991</td>
<td>2,391</td>
</tr>
<tr>
<td>Optimizing use of land for substations</td>
<td>Land saving (INR)</td>
<td>5,910 m(^2)</td>
<td>3,670 m(^2)</td>
</tr>
<tr>
<td>Reducing operating costs for maintaining substations</td>
<td>Operating expenditure (INR)</td>
<td>6 FTE per substation</td>
<td>4 FTE per substation</td>
</tr>
<tr>
<td>Increasing water availability for sale</td>
<td>Sale of recycled water</td>
<td>0 MLD</td>
<td>30 MLD</td>
</tr>
<tr>
<td>Increasing sewerage services reach to full city</td>
<td>Sewerage charges (INR)</td>
<td>0.03</td>
<td>13.2</td>
</tr>
</tbody>
</table>

(i) Sustainability given the fiscal situation of Government, ULB: land bank, betterment tax, etc.

The order of magnitude cost through each phase, time lined
## Eluru Smart City – Risk Analysis

<table>
<thead>
<tr>
<th>Risk Type</th>
<th>Degree (High/Moderate/Low)</th>
<th>Mitigation Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development Risk</td>
<td>Low</td>
<td>The entire city is being developed by a single consortium in an integrated manner with Govt, as key stakeholder and hence the Development Risk is low</td>
</tr>
<tr>
<td>Land Acquisition Delay</td>
<td>Low</td>
<td>Major part of the works shall be carried out on the Land owned by Municipal Corporation or Govt. of AP. So, Land Acquisition risk is perceived to be lower</td>
</tr>
<tr>
<td>Delay in receipt of statutory approvals</td>
<td>Low</td>
<td>Considering that the Govt. of AP is one of the stakeholder in the project, the Approval risks are perceived to be lower</td>
</tr>
<tr>
<td>Time and Cost Over runs</td>
<td>Moderate</td>
<td>The project is being developed by one of the largest infrastructure developer in India with strong international consortium, expected to be delivered within time and cost</td>
</tr>
<tr>
<td>Credit Risk</td>
<td>Low</td>
<td>Financing by EMC with support of Govt. of AP, the Credit Risk is also perceived to be lower</td>
</tr>
</tbody>
</table>
Eluru Smart City – Investment Opportunity

First time in the country, an integrated approach has been undertaken for pan city development of an existing urban cluster under the State Smart City initiative. Lifecycle based approach is also being adopted to bring in efficiencies in project delivery and operations.

By integrating the development of the city through an active citizen and stakeholder engagement, various synergies like saving the time and efforts in terms of procurement process, bringing in a large consortium of national and international players to develop the city and optimizing the financing structure to benefit government can be tapped to benefit government and the consortium.

Opportunity to partner in this innovative model of integrated Smart City development which is backed by Government, by participating in debt or equity or equity equivalents alongwith selected developer, total project cost of Rs 8,900 Mn (USD 120 Mn).

Replication of the Eluru Model being undertaken in other Smart Cities in the State. Other Smart Cities have received strong response from large developers to develop the entire city in an integrated manner like Eluru and with strong support from Govt. of Andhra Pradesh and respective Municipal Corporations.

Opportunity to partner with large and reputed consortiums for integrated urban development at pan city level with total project cost of Rs 11,500 Cr (USD 1,643 Mn).
### Projects and Investment Opportunities with APUIAML – participate as Developer, alongwith Developer or through Fund

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Current Pipeline of Projects</th>
<th>Proj. Cost Rs. Mn (USD Mn)</th>
<th>Status</th>
<th>Project Highlights</th>
</tr>
</thead>
</table>
| Urban Sewerage              | Visakhapatnam Sewerage                                           | 9,160 (131)                 | Project under implementation                 | • Phase one of the project is awarded, work to commence in Oct 2018. Term loan sanctioned of Rs2.45 Bn obtained for Ph 1  
• Second phase project development work has started and tender to be issued in Nov 2018  
• Offtake of treated water from large public sector undertakings in place and Govt. approvals and ULB funding in place |
| Economic Cities             | Jakkampudi Economic City Project                                 | 30,000 (428)                | Project under implementation                 | • Work commenced in Jun ’18, to be completed in 12 months. Allotment completed, rating of BBB+(Stable) from FITCH India Rating, funding tied-up  
• Economic Cities can be developed in other cities such as Amaravati, Vijayawada, Tirupati, Guntur, Rajahmundry and Visakhapatnam |
|                             | Visakhapatnam IT City                                           | 12,500 (178)                | Project under implementation                 | • Master planning for 3 million built up space in 22.8 acres is completed  
• Tender for 5 lac sft in Phase 1 is about to be released |
| Water Supply                | Vijayawada 24x7 Water Supply                                     | 5,750 (82)                  | Project Tendered                            | • Tender released for Phase 1 of the project with 16,500 house connections on pilot basis  
• Solve the issue of water supply in the City. With the experience obtained, similar Projects to be developed |
|                             | Madhurwada Water Supply                                         | 2,000 (28)                  | Project under Development                   | • Technical study being undertaken and DPR under preparation |
|                             | Tirupati Smart City                                             | 90,000 (1,285)              | Project under development                   | • Swiss challenge process approved, initial proposals received from Essel Infra, Cabinet approved and Essel declared as OPP, detailed proposal by Aug 2018 |
|                             | Eluru Smart City                                                | 8,900 (127)                 | Project Tendered                            | • Swiss challenge process approved, proposals received from Shapoorji-Siemens consortium, Tender released for counter challenge from other bidders |
|                             | Nellore, Kurnool, Ananthapur, Ongole, Srikakulam Smart Cities   | 25,000 (357)                | Some projects tendered and some under development | • Projects in various sectors such as Water, Power, Transportation etc. are being developed for smart cities in Phase 1 of the State Smart City Mission  
• Projects of Rs. 396 Cr have been worked out, of which Rs. 248 Cr worth projects have been tendered or being tendered |
| Smart Cities                | Multilevel Car Parking                                          | 1,000 (14)                  | Project under development                   | • Car park proposed in key business district with serious parking shortage  
• Tender in process of being released |
| Other Infrastructure Projects| Solid Waste Management                                          | 200 (3)                     | Project under development                   | • 100 TPD compost plant for GVMC as part of Swachh Bharat initiative  
• Technical survey under final stages |
|                             | Visakhapatnam BRTS                                              | 1,900 (27)                  | Project under development                   | • Project part of Smart City, technical survey and strategic report ready, DPR under preparation.  
• BRTS network is mostly in place, to be operationalised |
|                             | Visakhapatnam Floating Solar Park – 15MW                        | 1,090 (15)                  | Project under development                   | • Floating solar park of 15 MW, project being structured to be funded on commercial basis, tender already released |

**Total Cost:** 187,500 (2,678)
Thank You
To be among top 3 developed states in India by 2022
To be the No.1 state in development & happiness by 2029
To become a leading global investment destination by 2050

Projected Targets

SIZE OF THE ECONOMY

PER CAPITA INCOME (USD)

ACCELERATING ECONOMIC GROWTH

ENHANCING LABOUR PRODUCTIVITY

Key Performance Indicators

Cumulative Investments in range of USD145 Billion Economic growth CAGR @ 12%
Global Competitiveness HDI Index to be in Top 15
Employment for 14.4 Mn citizens
Eluru Smart City – City Profile

**Municipal Area**: 11.52 sq.km

**Population (2011 Census)**: 2.17 Lakhs

**Households**: 55,014

**Literacy Rate**: 83% (AP: 67%)

**Per Cap Income**: Rs.1,13,970

**Green Space**: 3.1 % of area

**Slum Population (2011 census)**: 84,697

**65 slums ~ 36% population**

**45 Govt. Schools**: 8,615 students

**Workforce**: 63,849 (29 % of population)

**Households**: 55,014

**Per Cap Income**: Rs.1,13,970

**Water Supply**: 135 lpcd

**66% Covered Area**

**Wastewater**: 32 MLD, UGD: Nil

**WW Treatment**: Nil

**Municipal Solid Waste**: 82 MT/day

**Airport**: Vijayawada (45 km)

**Railway Station**: Eluru

**National Highway**: NH 16

**Seaport**: Machilipatnam (77 km)

**Economic Base:**

- Weavers, rug weaving (wooden pile carpet industry)
- Agro-based industries

**Distance from Eluru:**

- Vijayawada – 70 km
- Amaravati (Greenfield Capital City) – 90 km
- Visakhapatnam – 290 km
- Hyderabad – 340 km

**Total 17 Smart Cities in the state (4 National + 13 State)**

**PORTS**

**AIRPORT**

**NATIONAL HIGHWAYS**

**MAJOR RAILWAY LINE**

**GDP**: Rs.3,801 Cr

**Agriculture**: 9%

**Industry**: 16%

**Services**: 75%

**Footpaths**: < 5%

**Streetlights**: 8380