Investor Presentation
- Q2 FY’20
In this presentation

IEX: Who we are

- Sector transformation
- Electricity value chain & Power market structure
- Way forward
Who we are

- Automated, open and transparent platform for physical delivery of electricity
- Commenced operations in 2008, CAGR 33%, CERC regulated
- India’s leading power exchange, Market Share: 97%
- Average daily trade 6000+ MW
- Record day volume: 308 MU’s (12,900 MW)
- Our customer base
  - 4000+ Industries
  - 55 Discoms (all)
  - 100+ ESCert Entities
  - 400+ Generators
  - 1500+ RE Generators & Obligated entities
- Publicly listed company (NSE and BSE)
Truly benefited Indian Power Sector

- Provides **benchmark prices** for all electricity transactions
- **Transparent** Mechanism for Price Discovery
- **High liquidity** on exchange has ensured lowest cost and assured supply

**Truly benefited Indian Power Sector**

**Generation**
- Signals for Generating Capacity addition (~35 GW Merchant plants)

**Transmission**
- Investments in transmission-congestion free – One Grid One Price

**Distribution**
- Lower power prices for discoms, end consumers.
- Avoids buying under take-or-pay contracts.
- **Flexibility** on 15-min basis
## Market segments

<table>
<thead>
<tr>
<th>Market Segment</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Day-Ahead Market**                  | - *Delivery for next day*  
- *Price discovery: Closed, Double-sided Auction*                                                                                     |
| **Term-Ahead Market**                 | - *Intraday: For Delivery within the same day*  
- *Day Ahead Contingency: Another window for next day*  
- *Daily and weekly contracts*                                                                                                          |
| **Renewable Energy Certificates**     | - *Green Attributes as Certificates*  
- *Sellers: RE generators not under feed in tariffs*  
- *Buyers: Obligated entities; 1MWh equivalent to 1 REC*                                                                                |
| **Energy Saving Certificates**        | - *1 ESCert = 1 mtoe (metric Tonne of Oil Equivalent)*  
- *Trading Session on every Tuesday of the Week*  
- *Trading time 1300 hrs to 1500 hrs*                                                                                                  |

Source: Company
Robust financial performance

Focus on operational excellence and financial prudence

Breakup of revenues

<table>
<thead>
<tr>
<th></th>
<th>Q2 FY 2019</th>
<th>Q1 FY 2020</th>
<th>Q2 FY 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transaction Fees</td>
<td>82%</td>
<td>81%</td>
<td>80%</td>
</tr>
<tr>
<td>Admission and Annual Fees</td>
<td>6%</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>Other Income</td>
<td>11%</td>
<td>13%</td>
<td>14%</td>
</tr>
</tbody>
</table>

Source: Company
In this presentation

IEX: Who we are

Sector transformation

Electricity value chain & Power market structure

Way forward
## Sector transformation drivers

<table>
<thead>
<tr>
<th>Decarbonization</th>
<th>Deployment of low-carbon technologies - wind and solar.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outlook:</strong></td>
<td>• Renewables to become leading energy sources</td>
</tr>
<tr>
<td></td>
<td>• Emerging new tech like hybrids</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Decentralization</th>
<th>Small-scale generation across T&amp;D network</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outlook:</strong></td>
<td>• RE a threat to centralized energy production</td>
</tr>
<tr>
<td></td>
<td>• Requirement of local solutions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Digitization</th>
<th>Intelligent CS and Apps to optimize plants and grid</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outlook:</strong></td>
<td>• Digital Tech to promote aggregation solutions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Democratization</th>
<th>Empowered consumers - economic power shift</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outlook:</strong></td>
<td>• Peer to peer energy trading</td>
</tr>
</tbody>
</table>
Sector transformation drivers

Paris Climate Agreement – Renewable energy to constitute 40% of total installed capacity base of 1250 GW

Changing Installed Capacity Mix – Increasing reliance on RE

Source: CEA

Hybridization requires technology driven apps and automation
In this presentation

- IEX: Who we are
- Sector transformation
- Electricity value chain & Power market structure
- Way forward
Electricity value chain

- **Generation**
  - De-licensed
  - Private sector ~46%
  - Generation in distress

- **Transmission**
  - Transmission is licensed
  - World's largest network

- **Distribution**
  - Licensed
  - Distribution licensed
  - Rs 81,468 Cr O/S*
  - DISCOM losses ~Rs.28,000 Cr
  - AT&C Loss

- **Energy deficit decreased from 10% to 0.7% over the last decade**

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**Table: Capacity (GW)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Capacity (GW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY'16</td>
<td>305</td>
</tr>
<tr>
<td>FY'17</td>
<td>327</td>
</tr>
<tr>
<td>FY'18</td>
<td>344</td>
</tr>
<tr>
<td>FY'19</td>
<td>356</td>
</tr>
<tr>
<td>FY'20 (1H'20)</td>
<td>362</td>
</tr>
</tbody>
</table>

**Share of REN**

- FY'16: 22%
- FY'17: 22%
- FY'18: 10.5%
- FY'19: 10.5%
- FY'20 (1H'20): 10.5%

**Table: Generation (BU)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Thermal</th>
<th>Nuclear</th>
<th>Hydro</th>
<th>Renewables</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY'16</td>
<td>1168</td>
<td></td>
<td></td>
<td>305</td>
</tr>
<tr>
<td>FY'17</td>
<td>1236</td>
<td></td>
<td></td>
<td>327</td>
</tr>
<tr>
<td>FY'18</td>
<td>1303</td>
<td></td>
<td></td>
<td>344</td>
</tr>
<tr>
<td>FY'19</td>
<td>1372</td>
<td></td>
<td></td>
<td>356</td>
</tr>
<tr>
<td>FY'20 (1H'20)</td>
<td>732</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table: CAGR (%)**

<table>
<thead>
<tr>
<th>Year</th>
<th>CAGR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY'16</td>
<td>6.7%</td>
</tr>
<tr>
<td>FY'17</td>
<td>18.8%</td>
</tr>
<tr>
<td>FY'18</td>
<td>24.4%</td>
</tr>
<tr>
<td>FY'19</td>
<td>5.5%</td>
</tr>
<tr>
<td>FY'20 (1H'20)</td>
<td>5.6%</td>
</tr>
</tbody>
</table>

**Table: Share of REN**

- Thermal: 96.5%
- Nuclear: 3%
- Hydro: 0.5%
- Renewables: 0%

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- As of Sept 2019; CAGR till FY'19, calculated as 4 yr CAGR except for Generation (3 year CAGR)
- Source: CEA; MOP 5 year vision; press
Electricity is a key driver to economic growth

- India is:
  - 3rd largest consumer of electricity
  - 3rd largest producer of electricity; and
  - 5th largest in the world in RE capacity

- Industries consume 42% of total electricity

- Agriculture and domestic consume 18% and 24% respectively

### Contribution to GDP %<sup>2</sup> vs FY’19 (%)

<table>
<thead>
<tr>
<th>Sector</th>
<th>FY’19 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry &amp; fishing</td>
<td>16.1</td>
</tr>
<tr>
<td>Mining &amp; quarrying</td>
<td>2.4</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>16.4</td>
</tr>
<tr>
<td>Construction</td>
<td>8.0</td>
</tr>
<tr>
<td>Services</td>
<td>57.1</td>
</tr>
</tbody>
</table>

### Sectors vs Power & fuel costs as a % of Rev<sup>3</sup>

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Power &amp; fuel costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilities</td>
<td>44%</td>
</tr>
<tr>
<td>Communication Services</td>
<td>38%</td>
</tr>
<tr>
<td>Materials</td>
<td>17%</td>
</tr>
<tr>
<td>Industrials</td>
<td>14%</td>
</tr>
<tr>
<td>Consumer Discretionary</td>
<td>11%</td>
</tr>
</tbody>
</table>

1. MoP – 5 year vision document for power sector; 2. MOSPI; CEIC; 3. Company reports; CMIE; defined as per GICS classification
Electricity consumption set to increase

- India a third of global average in per capita consumption
- Economic activity will accelerate
  - Government envisions India as a $5tn economy by FY’25
  - Manufacturing contribution up from 15% to 25%
  - Core sector growth will drive electricity consumption
- Rapid urbanization
  - 17 of 20 world’s fastest growing cities in India
- Consumer demand growth
  - Last mile connectivity - Saubhagya : Power for All
  - Power on 24x7 basis
## Power market structure

### Long Term (89.4%)
- **Up to 25 years**: 1,226.5 BU
  - **89.4%**

### Short Term (10.6%) (3Yr CAGR: 8%; 1H’20: -1.7%)
- **3Yr CAGR**: 8%
- **1H’20**: -1.7%

- **1,372 BU (incl REN)*
  - **Bilateral**: 1,226.5 BU
  - **OTC**: 66.5 BU
  - **Exchanges**: 53.5 BU
  - **Real Time**: 25.1 BU

### Long-term PPA
- **Bilateral & Banking Transactions**
- **Exchange (Only up to 11 days)**
  - DAC
  - Daily
  - Weekly
  - Day Ahead Market

### Bilateral (BU)

<table>
<thead>
<tr>
<th>Bilateral</th>
<th>Direct</th>
<th>Trader</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY17</td>
<td>FY18</td>
<td>FY19</td>
</tr>
<tr>
<td>PXs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>47</td>
<td>54</td>
</tr>
</tbody>
</table>

### Exchange (BU)

<table>
<thead>
<tr>
<th>PXs</th>
<th>FY17</th>
<th>FY18</th>
<th>FY19</th>
<th>1H FY’20</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>47</td>
<td>54</td>
<td>29</td>
<td>1.8%</td>
</tr>
</tbody>
</table>

### DSM (BU)

<table>
<thead>
<tr>
<th>DSM</th>
<th>FY17</th>
<th>FY18</th>
<th>FY19</th>
<th>1H FY’20</th>
</tr>
</thead>
<tbody>
<tr>
<td>PXs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>24</td>
<td>25</td>
<td>12</td>
<td>-6.2%</td>
</tr>
</tbody>
</table>

### Deviation settlement/Unscheduled Interchange

- **3.5%**
- **-7.2%**
- **9.5%**
- **-27.1%**

- **As of FY’19; CAGR calculated for 3 years ending FY’19**
- **Source: CEA, CERC**
Markets have immense potential

- India’s per capita electricity demand is 1/3rd global average
- ~45 GW of PPA’s retiring in the next 8 years
- ~4.3 GW of PPA’s (LT and MT) expiring in the next 8 years

Source: 1. CERC; 2. World Bank; 3. CEA
Global benchmarking

Exchange market and ST market a % of total demand – India¹

<table>
<thead>
<tr>
<th>Year</th>
<th>ST Market %</th>
<th>Exchanges %</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY15</td>
<td>9.3%</td>
<td>2.7%</td>
</tr>
<tr>
<td>FY16</td>
<td>10.3%</td>
<td>3.1%</td>
</tr>
<tr>
<td>FY17</td>
<td>10.4%</td>
<td>3.6%</td>
</tr>
<tr>
<td>FY18</td>
<td>10.5%</td>
<td>3.9%</td>
</tr>
<tr>
<td>FY19</td>
<td>11.4%</td>
<td>4.1%</td>
</tr>
</tbody>
</table>

Exchange market as a % of total demand – Global²

- Nordpool: 91%
- Germany: 49%
- UK: 47%
- Netherlands: 39%
- Switzerland: 34%
- Belgium: 23%
- France: 15%

Share of ST Market in total demand
Share of exchanges in total demand

Power markets in developed economies are in the range of 30-80% of total power demand vis a vis 4% in India

Source: 1. CERC; 2. CRISIL Study
In this presentation

IEX : Who we are

Sector transformation

Electricity value chain & Power market structure

Way forward
1. **Expand coverage and market**
   - Launch new products
   - Advocacy to increase short term market

2. **Best in class, futuristic Technology Infrastructure**
   - Enterprise IT, trading platform
   - Technology & analytics solutions for customers

3. **Strengthen the organisation**
   - Capacity building, hi-performance culture
   - Talent acquisition, development and retention

4. **Business diversification**
   - Play in the energy (eg. - gas) basket of India
   - Energy efficiency technology solutions
Expand coverage and market

**New Product Launches**
- Real time electricity market
- Cross Border Trade
- Longer Duration Contracts
- Green TAM
- Exchange based Ancillary Market
- Gross Bidding

**Tech based**
- Smart Power Procurement
- Analytics
- New Product Development

Open Access + DISCOM Maximization
Technology in transformation

**Manual Workflow**

- In-House Development
- Limited Products
- Disparate System
- Desktop Based
- Monolithic
- Product: GMEX, UTrade, Nagarro, Twilio
- System Design: Cap Gemini, TCIL, Akamai
- Automation Anywhere, UIPath, Pentaho

**Automated Digital Mesh**

- Digital Inside
- Open API integration
- Robotic Process Automation

**Modular Digital Twins**

- Service Oriented Architecture
- Automated Bank Integration

**All Platforms**

- Web Based Portal
- Trading App

**Intuitive System**

- Customer Survey Driven UX design
- Unified Risk Management
- Proactive Alerts

**Configurable Products**

- Re-architecture
- Long Duration Contract, RTM

**Partnerships**

- Product: GMEX, UTrade, Nagarro, Twilio
- System Design: Cap Gemini, TCIL, Akamai
- Automation Anywhere, UIPath, Pentaho
Customer Experience

S – Self-service web/mobile applications
  • enable customers anytime anywhere easy access

I – Intelligent process automation
  • reduce customer effort; insights to enable effective decision making

M – Matching engine optimization
  • increase social welfare

P – Product launches
  • meet the needs of all customer segments

L – Learning opportunities for our customers
  • experiential learning for customers through organizing events

E – Energy portfolio management solutions
  • optimize procurement cost for customers

Create effective solutions to fulfil all Power Procurement related needs of our customers
<table>
<thead>
<tr>
<th><strong>Gas Exchange</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goi vision of gas based economy</strong></td>
</tr>
<tr>
<td>• Goi policy targets to increase share of natural gas in India’s energy basket from 6.5% to 15% in 5 years.</td>
</tr>
<tr>
<td>• This would lead to Indian Gas market growing 2.5X (166 to 380 MMSCMD) by 2030.</td>
</tr>
<tr>
<td>• A robust gas trading exchange enabling seamless transactions can help Goi realize this ambitious target.</td>
</tr>
<tr>
<td><strong>Market gaps and need</strong></td>
</tr>
<tr>
<td>• Buyers desire price transparency, flexibility and anonymity to overcome suppliers' bargaining power.</td>
</tr>
<tr>
<td>• MoPNG has expressed the need for a Gas Trading Hub. Taken steps towards market development.</td>
</tr>
<tr>
<td><strong>Our plan/solution</strong></td>
</tr>
<tr>
<td>• To optimize trading value chain, plan to set up a Gas Exchange - Physical hubs near Dahej and Kakinada.</td>
</tr>
<tr>
<td>• Prompt and longer duration products with delivery facilitation by the exchange.</td>
</tr>
<tr>
<td>• State of the art and proven exchange technology backed with long experience in electricity</td>
</tr>
<tr>
<td><strong>Enablers required for success</strong></td>
</tr>
<tr>
<td>• The history of gas market hubs globally has shown that certain steps are needed to enable development</td>
</tr>
<tr>
<td>• Few technical issues need resolution to ensure liquidity and enable efficient trading at the hub</td>
</tr>
</tbody>
</table>
Thank You
ANNEXURES
Industrial consumers on IEX

Registered open Access Consumers
- By States  (As on 30th September, 19)

- Tamil Nadu, 891
- Gujarat, 541
- Andhra Pradesh, 498
- Haryana, 479
- Punjab, 427
- Karnataka, 259
- Telangana, 224
- Uttarakhand, 135
- Others, 303

Open Access consumers spread across industries¹  (As on 30th September, 19)

- Textile: 305
- Metal: 177
- Chemical: 116
- Automobiles: 116
- Cement: 79
- Others: 254

¹ Active consumers
Cost optimization - Punjab DISCOM

**Sell**

Sold 1430 Mus during Sep/Oct’ 18 @ Rs.5.74/u. Additional revenue of Rs.350 Cr.

**Buy**

Purchased 385 Mus from exchange at average rate of Rs.3.09 per unit resulting into savings of Rs.19 Cr.

**Replace**

Back down/reduced the power drawn from private thermal plants and replaced it with a very low cost power available at exchange during night in the month of Nov/Dec 2018.

- PSPCL case of optimization used to mobilize states currently not doing optimization through market
The prices discovered at DEEP- portal are ranging from Rs. 5.48 - Rs. 5.80 per unit, much higher in comparison to IEX prices.

<table>
<thead>
<tr>
<th>Period</th>
<th>Energy as per Tender (MUs)</th>
<th>L1 Price discovered in DEEP Portal</th>
<th>Power Purchase cost (Rs.Cr)</th>
<th>IEX Avg Price FY 2018-19 (Delivered)</th>
<th>10% increase in IEX Prices (Delivered)</th>
<th>Cost if purchased at IEX (Rs Cr) (without escalation)</th>
<th>Cost if purchased at IEX (Rs Cr) (with escalation)</th>
<th>Savings – IEX price as last year (Rs.Cr)</th>
<th>Savings - IEX last year price with 10% escalation (Rs.Cr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jul-19</td>
<td>744</td>
<td>5.48</td>
<td>408</td>
<td>3.72</td>
<td>4.09</td>
<td>277</td>
<td>304</td>
<td>131</td>
<td>103</td>
</tr>
<tr>
<td>Aug-19</td>
<td>744</td>
<td>5.48</td>
<td>408</td>
<td>3.62</td>
<td>3.98</td>
<td>269</td>
<td>296</td>
<td>138</td>
<td>111</td>
</tr>
<tr>
<td>Sep-19</td>
<td>720</td>
<td>5.48</td>
<td>395</td>
<td>4.97</td>
<td>5.47</td>
<td>358</td>
<td>394</td>
<td>37</td>
<td>1</td>
</tr>
<tr>
<td>Oct-19</td>
<td>744</td>
<td>5.48</td>
<td>408</td>
<td>7.06</td>
<td>7.77</td>
<td>525</td>
<td>578</td>
<td>-118</td>
<td>-170</td>
</tr>
<tr>
<td>Nov-19</td>
<td>720</td>
<td>5.48</td>
<td>395</td>
<td>3.90</td>
<td>4.29</td>
<td>281</td>
<td>309</td>
<td>114</td>
<td>86</td>
</tr>
<tr>
<td>Dec-19</td>
<td>744</td>
<td>5.48</td>
<td>408</td>
<td>3.60</td>
<td>3.96</td>
<td>268</td>
<td>295</td>
<td>140</td>
<td>113</td>
</tr>
<tr>
<td>Jan-20</td>
<td>744</td>
<td>5.48</td>
<td>408</td>
<td>3.61</td>
<td>3.97</td>
<td>269</td>
<td>295</td>
<td>139</td>
<td>112</td>
</tr>
<tr>
<td>Feb-20</td>
<td>696</td>
<td>5.48</td>
<td>381</td>
<td>3.49</td>
<td>3.84</td>
<td>243</td>
<td>267</td>
<td>139</td>
<td>114</td>
</tr>
<tr>
<td>Mar-20</td>
<td>744</td>
<td>5.48</td>
<td>408</td>
<td>3.77</td>
<td>4.15</td>
<td>280</td>
<td>309</td>
<td>127</td>
<td>99</td>
</tr>
<tr>
<td>Total</td>
<td>6600</td>
<td>5.48</td>
<td>3617</td>
<td>4.19</td>
<td>4.61</td>
<td>2770</td>
<td>3047</td>
<td>847</td>
<td>570</td>
</tr>
</tbody>
</table>

*Above price comparison is at Telangana state periphery*