ANDHRA PRADESH
India's Sunrise State

POWERING
Andhra Pradesh
ENERGY INNOVATION SUMMIT 2018
28-29 November | VIJAYAWADA

Ideas FORUM

NREDCAP

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I. ABOUT THE SUMMIT

The Government of Andhra Pradesh is hosting '**Powering Andhra Pradesh**' - a global energy innovation summit to shape the future of energy in Andhra Pradesh on **28-29 November 2018** in **Vijayawada, India**.

This will be a first of its kind summit in the energy sector in a developing country that will:

- **Go beyond the most common themes** by including themes across the entire energy value chain along with cross-cutting levers such as climate change
- **Focus on innovation** and showcase cutting edge technologies in the energy sector
- **Convene future-oriented voices** by bringing global experts, investors, incubators, startups under one roof
- **Focus on communicating actionably** by using a mix of formats that can help surface concrete recommendations

Andhra Pradesh has been at the forefront of the energy sector and has now set a challenging vision to transform its energy sector. To help achieve the state's vision for the energy sector, the summit will bring together energy experts from a wide range of organizations including private sector, international agencies, donors, investors, independent think tanks, research institutions and governments to share technology innovations and best practices for transforming the energy landscape. The summit will comprise of a mix of events aimed at sharing of knowledge and developing actionable recommendations, including:

- **Ideas Forum** where leading experts from a wide range of organizations share best practices, trends, and principles on innovations in energy through keynotes and panel discussions
- **Pitch Competition** where 'energy-preneurs' pitch innovations that can help Andhra Pradesh solve the emerging energy challenges and meet its demand, while making it more livable
- **Focused Workshops** *(invite only)* where targeted, collaborative sessions will be held that bring together experts and government representatives to ideate and design an actionable roadmap for the energy sector in Andhra Pradesh
- **Exhibition** showcasing leading and innovative products, services, technologies, designs and concepts in the energy space
- **Networking events and dinners**

The Summit seeks to leverage global best practices and cutting-edge technologies to help Andhra Pradesh achieve its energy sector vision. Additionally, it aims to develop a thriving ecosystem for the energy sector in the state by attracting investments from large companies and start-ups in the state.

The summit is anchored on five themes, as represented in the figure below:

1 Conventional Power

Improving efficiency and reducing emissions of power plants

A. Fuel security

- Offshore & onshore gas storage
- Fuel efficiency

B. Gas power stations

- Hybrid gas power plants
- Higher efficiency gas turbines

C. Emission reduction

- Cleaner fuel and combustion
- Carbon capture and storage

D. Digitising power plants

- Operational efficiency
- Increasing uptime and safety

2 Renewable Energy

Harnessing new sources and enhancing efficacy of existing sources

A. Large scale renewables

- Large solar & wind parks
- Hybrid solar & wind plants

B. Floating/ offshore renewables

- Offshore solar/ wind plants
- Wave & tidal energy

C. Distributed generation

- Micro/mini grids
- Roof top solar
- Solar water pumps

3 Grid Upgradation

Futureproofing grids and strengthening sustainability of DISCOMs

A. T&D infra improvement

- Integration of renewables
- Increase in grid capacity

B. Smart grids

- Load management
- Smart metering
- Virtual Power Plants

C. Sustainability of DISCOMs

- DISCOM financial health
- T&D loss reduction

D. Utility scale storage

- Thermal and Pumped hydro storage
- Fuel cells

4 Energy Efficiency

Installing smart appliances in personal and collective spaces

A. Smart appliances

- Intelligent appliances
- Energy efficient lighting and appliances

B. Efficiency in built spaces

- Smart lighting
- Building energy management

5 Mobility

Incentivizing electric vehicles' adoption through innovation

A. EVs and batteries

- Electric vehicles (public, private)
- Battery technologies

B. EV infrastructure

- Charging stations
- EV parking spaces

II. OBJECTIVES AND FORMAT

The Ideas Forum is an interactive format that will bring together panelists from diverse fields to discuss how interventions across select thematic areas can contribute to addressing the gaps in Andhra Pradesh's energy sector and help the state achieve its energy sector vision. The Forum will be moderated by eminent experts and will include opportunities for the panelists to debate ideas, confer solutions and interact with the audience.
We expect discussions at the Ideas Forum to:

- Uncover best practices and principles on securing quantity and quality of energy, that can be tested and incorporated by the new and existing projects
- Resolve incongruencies between thought and action in energy innovation, by bringing practical, implementable ideas to the forefront
- Open doors for collaboration between individuals and organizations with common goals and objectives

III. AGENDA FOR DISCUSSION

There will be five panels across the two days of the Summit, centered around each of the themes mentioned above. The preliminary discussion agenda for each of the panels is given below.

#1: Renewable Energy – Serving demand through clean sources

Last year, India added more power generation capacity through renewable sources than conventional sources and was ranked as the second most attractive market for renewable energy investment. Falling prices of renewables allowed it to compete with conventional sources, catalyzed capacity addition and made it possible for developing countries like India to take a lead in fighting climate change. **India has now set an ambitious target of installing 175 GW of renewable power by FY22, and Andhra Pradesh wants to add 18 GW of renewable power by FY22. As Andhra Pradesh looks to develop a forward-looking energy strategy with 30% renewable share in installed capacity, it will need commensurate increase in capacity, with the right mix of sources.**

- What are the innovative configurations for renewable energy that should be considered for meeting the capacity addition targets (e.g. large-scale renewables, floating/ offshore renewables, distributed renewables)? Which innovative configurations may be well-suited to a state like Andhra Pradesh?
- What are the emerging innovations in harnessing new sources of renewable energy (e.g. tidal energy) and increasing the efficiency of existing renewable sources?
- For a state that is looking to add renewable capacity, what are the potential challenges from a generation, consumption and storage standpoint? How can we learn from global best practices to deal with these?
- What policy impetus can be provided to i) incentivize renewable energy generation and consumption, and ii) attract private investment?

#2: Conventional Energy – Improving quality of existing sources through innovative technologies

Conventional power currently forms ~70% of Andhra Pradesh's total installed capacity. Even as renewables get added, conventional power is expected to continue to hold a significant share of the energy capacity in the state. Conventional sources are critical because they are a more stable source of power unlike renewables. However, given conventional energy's far-reaching effects on the climate and its inevitable generation and usage, it is imperative to understand how efficiency can be improved and negative effects be minimized.

- How can we mitigate supply risks to ensure continuous supply of fuel for conventional plants? Are there innovative technologies that can be explored (e.g. off-shore and on-shore storage)?
- How can we improve the efficiency of fuel consumption in conventional power plants? Are there innovative technologies like flexi-fuel firing in coal or gas power plants that can be explored?
- What are the emerging technologies to reduce harmful emissions from existing and future power plants (e.g. carbon capture and storage)?
- What are the upcoming digital technologies to increase operational efficiency, uptime and safety of power plants? What are their applications and how can they be embedded (e.g. using AI, IoT, Machine Learning)?
- How can policy be shaped to incentivize reduced emissions and reward improved efficiency of conventional power plants?

#3: Grid Upgradation – Grids of the future and DISCOM sustainability

Power generation capacity addition and rising share of renewable energy would require major upgrades to the electric grid in terms of replacement of ageing infrastructure, increasing off-take and ensuring interoperability. Increasing RE penetration and proliferation of distributed systems also means the grid of the future will have to be smarter, more stable and resilient to deliver continuous and quality power requiring digitization. **Further, high T&D losses have traditionally plagued India's electric grid and Andhra Pradesh, even though among leading states on this metric, has set itself a target of reducing losses to below 3% from the current 10%.** A crucial lever to implement and sustain this transformation to a smarter grid however, is the sustainability of DISCOMs and their ability to operate reliably and profitably in future electricity markets.

- How can the capacity, financial and business model sustainability of DISCOMs be improved? Are there any global examples we can learn from?
- What are some emerging technologies in the T&D space to upgrade electric grids and make them more resilient, interoperable, and able to cater to diverse sources such as renewables?
- How can smart grids be leveraged for efficient load management, as well as linking disparate sources of energy? What critical inputs are required for them to be widely adopted?
- What role will storage play in grid modernization and what are some promising technologies in the space? What are the barriers to their wider adoption?
- What are some innovative solutions which can be adopted to minimize T&D losses (e.g. Smart Metering)? How can states catalyze wider adoption of such solutions?

- How can we create 'grid-aware' incentives i.e., rewarding RE generators and power utilities that incorporate technologies that contribute to grid stability?

#4: Mobility – Riding Electric: Road to Electric Vehicles

Stringent emission norms, rising fuel prices, innovation in battery technology and lower operating costs have captured the imagination of businesses and policy makers globally, driving adoption of Electric Vehicles (EVs). **Andhra Pradesh aims to attract an investment of INR 30,000 crores (~ USD 4.5 bn) in EVs and bring 10 lakhs (1 million) EVs on road by 2023.** However, lack of supporting infrastructure and viable business models may restrict mass adoption.

- Besides electric cars, what exciting technological developments have occurred in the EV space that are well-suited to a developing country like India (e.g. e-rickshaws, e-buses)?
- As Andhra Pradesh looks to get 10 lakh EVs on road by 2023, what supporting infrastructure needs to be put in place? Are there global case studies where cities that have a fair share of EVs developed this infrastructure?
- What will it take to increase investments in local manufacturing of required components (e.g. lithium-ion batteries)?
- How can public transport systems be made cleaner, and are there any global examples we can learn from?
- How can the government incentivize development and commercialization of technology for electric vehicles? How can it drive EV adoption among private and public transport users?

#5: Energy Efficiency – Building smart spaces and appliances

Andhra Pradesh, the first state in the country to come up with an inventory of greenhouse emissions, aims to save ~12,000 MU of electricity annually, as against the total annual energy requirement of ~50,000 MU, which would save an estimated INR 6,000 crore (~ USD 850 mn) annually. In this context, energy-efficient 'smart' appliances in both personal and collective spaces have the potential to not only help battle climate change by reducing emissions, but also lead to monetary savings on energy bills.

- What are the technological advancements in making appliances 'smarter' and what are the most-promising use cases?
- How can government incentivize the adoption of smart appliances?
- How can the existing as well as new residential and commercial buildings be made energy efficient?
- How can individual behavior (household, industrial and agricultural) be nudged for better efficiency? Are there any tried and tested global examples we can learn from?

Agenda

Day 1 (November 28)	Day 2 (November 29)	
	8:30 – 9:45 am **Breakfast with CM and experts** (invitation only)	
	9:45 – 10:00 am **Announcement of pitch-competition winners**	
	10:00 am – 11:15 am **Smart spaces and Energy efficiency** | Panel	10:00 - 12:00 am **Workshop - Part 1 | Generation, Transmission and Distribution –** Themes 1, 2, 3 *(invitation only)*
10:30 am – 12:00 pm **Inauguration and Opening Address by Hon'ble Chief Minister**	11:30 am – 12:45 pm **Riding Electric: Road to EVs** | Rapid fire panel discussion	
12:00 – 1:00 pm **Address by key note speakers**	12:45 – 1:45 pm **Lunch and networking**	
1:00 – 2:00 pm **Lunch and networking**		
2:00 – 3:15 pm **Serving energy demand through renewables** | Panel	1:45 – 3:00 pm **Innovations in Conventional Energy** | Panel	1:45 - 3:45 pm **Workshop - Part 2 | Consumption –** Themes 4, 5 *(invitation only)*
3:30 – 4:30 pm **Pitch competition - Part 1**	3:45 – 4:45 pm **Valedictory Address**	
4:30 - 4:45 pm: **Tea**		
4:45 – 6:00 pm **Grids of the future and DISCOM sustainability** | Panel	4:45 pm – 5:15 pm: **Tea**	
6:00 - 7:00 pm **Pitch competition – Part 2**		
7:00 pm onwards **Dinner hosted by the Hon'ble Chief Minister** *(invitation only)*		

Pitch competition

Panel discussion

Workshop