



# Investor Presentation – Q2 FY'24

Accelerating India's Sustainable Energy Transition



# In this presentation:

### Sector in Transition

**Electricity Value Chain** 

IEX: Who We Are

Indian Gas Exchange (IGX)

International Carbon Exchange (ICX)

Way Forward

### **Sector in Transition**





Decarbonisation

Deployment of Low-Carbon Technologies - Wind and Solar



Decentralisation

Small-scale Generation Across T&D Network



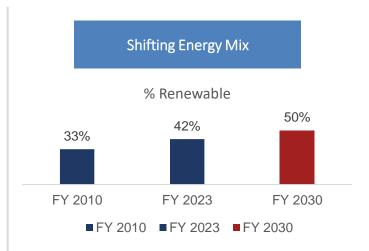
Democratisation

Empowered Consumers - Economic Power Shift



Digitisation

Intelligent Apps to Optimize Plants and Grid



- ➤ 178.6 GW installed renewable capacity (including large hydro) Apr-Sep FY'24
- ➤ India aspires to achieve 500 GW of renewable capacity by 2030



# In this presentation:

**Sector in Transition** 

### **Electricity Value Chain**

IEX: Who We Are

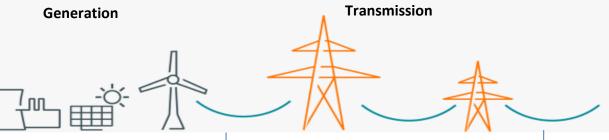
Indian Gas Exchange (IGX)

International Carbon Exchange (ICX)

Way Forward

# **Electricity Value Chain**





### Distribution & Consumption

Energy	Transition
--------	------------

Installed Capacity	As on 30 <sup>th</sup> Sep'23	FY 2030 CEA Proj.
Total GW	425	817
Coal Cap GW	239	267
Coal (%)	56.2	32.7
RE & Hydro GW	178.6	506
RE & Hydro %	42.0	61.9
Upcoming Coal Cap GW (in next 3 Yrs)	27 GW	-

#### **World's Largest Network**

- ➤ Inter-reg. trans. Cap.: 112.3 GW
- ➤ 4.72 Lakh CKM of trans. Lines (FY'25)
- Green Corridor: RE rich states; projects for evacuation of RE into National grid
- > 99.9% times no congestion

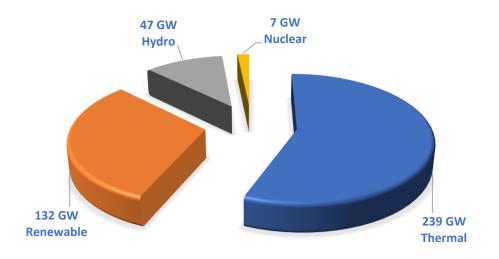
### **Reforms Underway**

- Avg. AT & C Losses: FY'21 22.3%; FY'22 – 16.4%; Expected to have declined to 13.5% for FY'23
- Reduction in Outstanding dues & ensuring future payments
- ➤ Liquidity Infusion Schemes
- Choice to Consumers
- ➤ Electrification as Decarbonization Lever: EV, Cooking, Traction

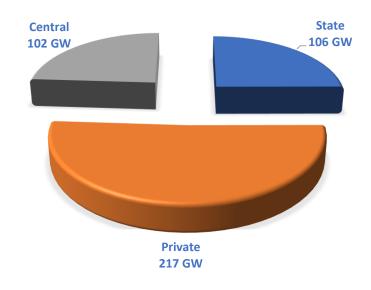
# **Installed Capacity = 425 GW**



### **Capacity by Source**

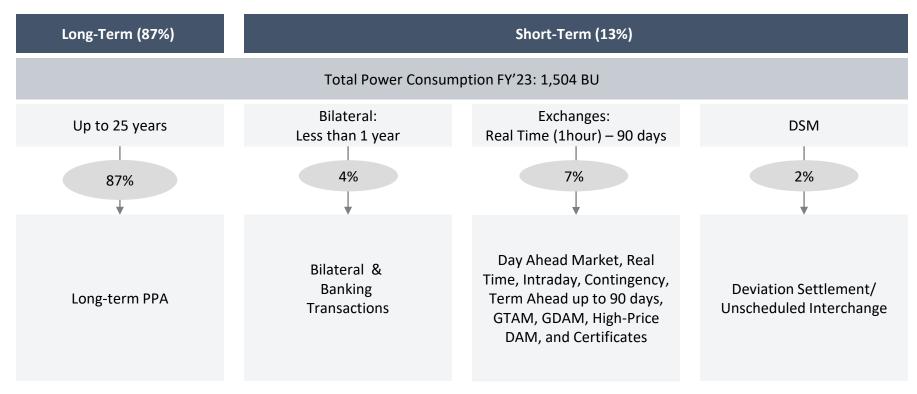


### **Capacity by Ownership**



### **Sector Construct**

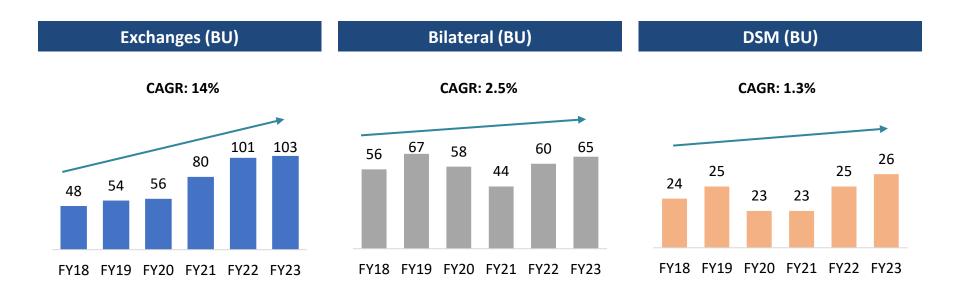




Source: CERC MMR Report till March'23

# **Exchange Markets are growing fast**

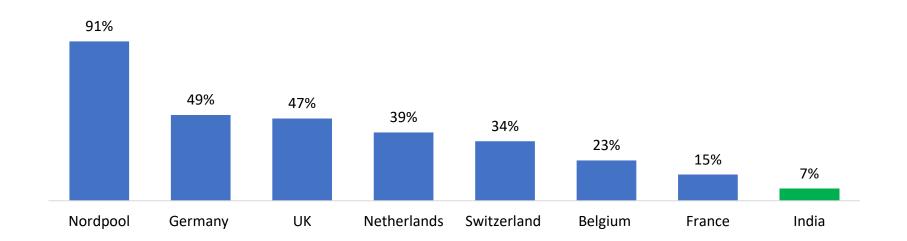




Source: CERC, MMR Reports till Mar 23

# **Immense Potential to Deepen India's Power Market**



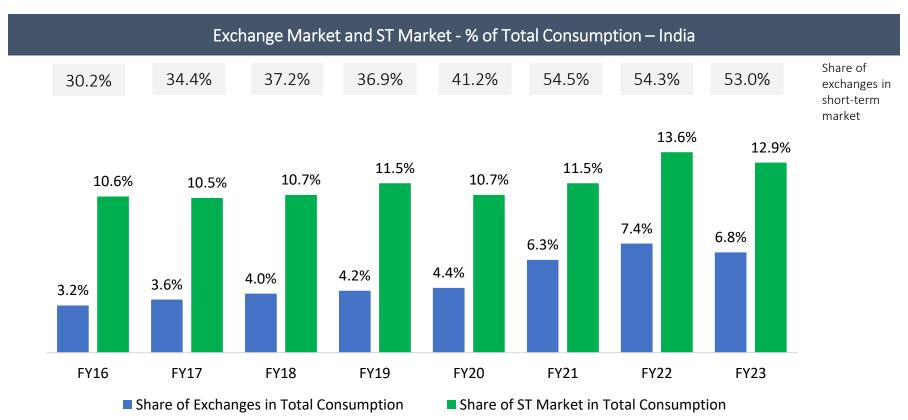


Note: Data for India till Mar'23

Source: CRISIL Study

# **Exchanges Share in Short Term Market**





### **Electricity Growth Drivers**



#### India is placed as the most promising economy on the global map

#### Industrialization

- ✓ High GDP growth of about 7% expected to drive electricity
- ✓ Core sector, traction, EV, cooking will drive electricity consumption

#### > Rapid urbanization/ Rural Electrification

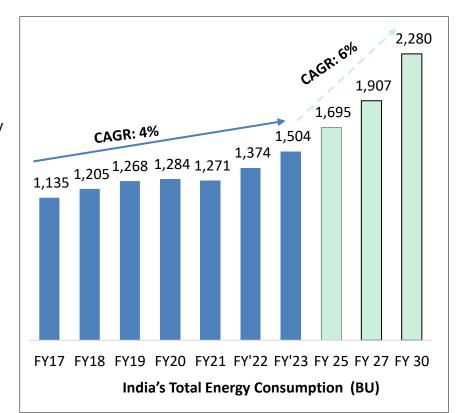
√ 17 out of 20 of world's fastest growing cities in India

#### Consumer demand growth

- ✓ Last mile connectivity Power on 24x7 basis
- ✓ FY23 energy consumption growth 9.4% YoY

#### > Power Demand Projection for FY 23-30

- ✓ FY 23 onwards CEA demand growth projections
- ✓ FY 25 CEA Peak Demand Projection 256 GW
- ✓ Expected to grow at CAGR of 6%





# In this presentation:

**Sector in Transition** 

**Electricity Value Chain** 

### IEX: Who We Are

Indian Gas Exchange (IGX)

International Carbon Exchange (ICX)

Way Forward

# **India's Premier Technology-led Energy Marketplace**



- ➤ Nation wide, automated and transparent trading platform for physical delivery of electricity, renewables & certificates
- ➤ Commenced operations in 2008; CERC regulated
- ➤ Publicly listed company 2017 (NSE and BSE)
- ➤ ISO 9001:2015, ISO 27001:2013, ISO 14001:2015
- ➤ Electricity Volume CAGR ~ 30% since 2008
- > FY23 Electricity Volume: 96.8 BU

#### **Robust Ecosystem**

7,500+

Registered participants

600+

Generators

4,600+

Commercial & Industries

60+

Discoms (all)

1,800+

RE Generators & Obligated Entities

100+

**ESCert Entities** 

30%

Volume Growth CAGR since 2008

# 15 Years of Servicing India's Electricity Market-Place





66

"The benefit of IEX is its ability to adapt to the requirements of the Customers as per market dynamics."

All through the last fifteen years, IEX championed the cause of the creation of Energy Exchanges in the Country by enhancing the width and breadth of the market. The Past decade has witnessed many changes in how the resource-wise mix of power is transformed and how it is contracted and traded. Conventional sources were dominating the market predominantly, but it is now the turn to Renewable Energy Sources. Matching with the day-to-day requirements, several market segments are innovatively devised by the IEX and implemented successfully much to the delight of its Customers. Certainly, IEX has brought in a lot of societal benefits through its algorithms for the determination of clearing prices. With the advent of surplus renewable generation, Renewable Energy Certificates, and facilitation to trade the same through the exchanges, the role of exchanges became manifold. The introduction of Real Time Market (RTM) in the power sector in the year 2020 more particularly by IEX within no time of coming into force the Regulations, has completely changed the paradigm of Intra day procurement.

Mr. KVN Chakradhar Babu, IAS
Joint Managing Director (AP Transco) &
Member Convenor (APPCC)





coming years.

I, on behalf of the PCKL team, would like to congratulate Indian Energy Exchange (IEX) on its 15th anniversary and we are delighted to be associated with them.

IEX has been an important partner for us and has provided PCKL with the ease of trading power/green power of Karnataka DISCOMs to an extent of 12500 MU at competitive prices in a transparent manner from FY 18.

On this 15th anniversary, we wish IEX all the best for the

Mr. V. Krishnappa, Managing Director Power Company of Karnataka Limited





Congratulations to the Indian Energy Exchange team for completing 15 glorious years in the power market.

The Exchange is dedicated to enabling competitive price discovery and the introduction of new products in the market.

We have been associated with IEX since its inception and look forward to more innovative tools and products so that our state can meet growing demand in a more cost-effective way. Once again my best wishes to the IEX team.

Mr. M. M. Ranwa, Managing Director Rajasthan Urja Vikas Nigam Limited



# **Benefitting Power Sector....and the Nation**



- > 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**



Signals for Generating Capacity Addition



Investments in Transmission-Congestion Free – One Grid One Price



Distribution

- Lower Power Prices for Discoms, End Consumers
- Avoids Buying Undertake-or-Pay Contracts
- > Flexibility on 15-min Basis
- ➤ Delivery in 1 Hour Notice

### **Our Values**















### **Market Segments**



#### **Integrated Day Ahead Market**

#### DAM since Jun'08

- Delivery for next day; 15 min. contracts, Daily trade
- Price discovery: Closed , Double-sided Auction

#### G-DAM since Oct'21

- Same as DAM, priority for GDAM in price & volume
- Option to carry forward uncleared bids in GDAM to conventional DAM; Single price for different RE - solar, non-solar

#### HP-DAM since Mar '23

- Segment within I-DAM on day ahead basis; Double-Sided Closed Auction
- Separate price discovery with price cap of Rs. 20/unit and floor price of zero
- Bidding during DAM, GDAM hours; Market Clearing in sequential manner GDAM, DAM, HP-DAM

#### Ancillary Services (DAM-AS) since Jun'23

- Procurement of capacity for TRAS by NLDC
- Separate windows for TRAS-UP and TRAS-DOWN

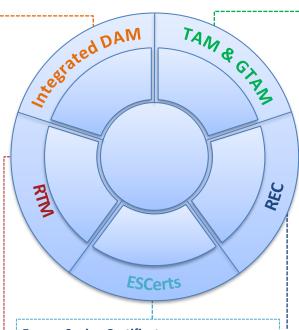
#### **Real Time Market**

#### Since Jun'20

- Half Hourly market (48 times per day)
- Delivery for 30 mins in two-time blocks of 15 min each
- Double sided closed auction with uniform price

#### Ancillary Services (RTM-AS) since Jun'23

Separate windows for TRAS-UP and TRAS-DOWN



### **Energy Saving Certificates**

#### Since Sep'17

• 1 ESCert = 1 Mtoe (Metric Tonne Oil Equivalent)

#### **Intraday Market & Contingency Market Segment**

#### Since Jul'15

- Intraday Market: hourly and or 15-minute contracts on same day on rolling basis
- Day-Ahead Contingency- 24-hourly and or 15-minute contracts on day-ahead basis for 00:00 hours to 24:00 hours of next day
- Continuous Trade

#### **Term-Ahead Contracts**

Since June'22 (up to 3 months)

- Any day (s) single side Reverse Auction
- Daily (up to 14 days)
- Weekly (up to 12 weeks)
- Monthly (up to 3 months)

#### **Green Term-Ahead Contracts**

#### Since 21 Aug'20

- 15-minute quotation of quantity (MW) and price (Rs/MWh)
- Price discovery and matching on 'Continuous Trade' basis
- Revision in schedule not allowed

#### **High Price Term-Ahead Contracts**

#### Since 18 Oct'23

 Contracts include HP-Intraday, HP-DAC, HP Daily, HP Monthly, HP Any Day Single Side

#### **Renewable Energy Certificates**

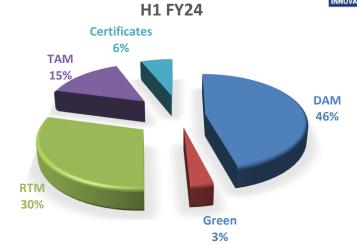
#### Since Feb'11

- Green Attributes as Certificates
- Sellers: RE generators not under feed in tariffs
- Buyers: Obligated entities; 1MWh equivalent to 1 REC

### **IEX Product Mix**







**Total Volume: 96.8 BU** 

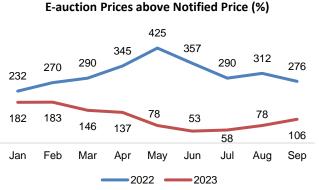
Total	Vo	lum	۱۵۰	51	7	RH	ı
IULA	ı vu	ıuıı	ıe.	ЭТ	. /	DU	,

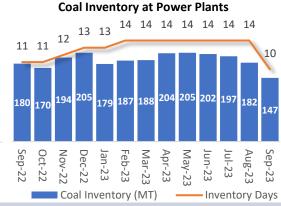
Matching	Closed, Double- sided Auction	Open Auction -Uniform Price Step	Continuous Matching	Reverse Auction
Existing Products	DAM, GDAM, RTM	Weekly, Daily	ITD & DAC	
New Products	HP-DAM, GDAM (HYDRO); DAM-AS; RTM-AS	Weekly (Up to 12 Weeks); Daily (Up to 90 Days); Monthly (Up to 3 <sup>rd</sup> Month)	-	Any Day Single Sided

# **Supply Side Constraints Easing**





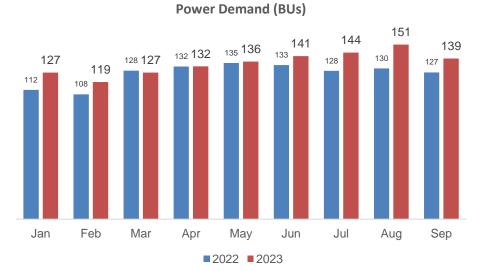


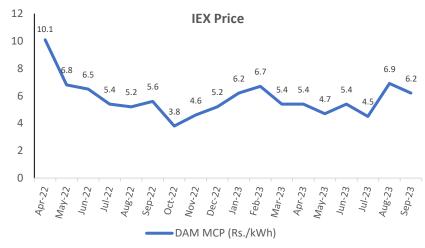


- Supply side constraints continued to ease through Q2 FY'24
- Q2 FY'24 coal production higher by 16% YoY at 205MT; Q1 was higher by 8.6% YoY
- Imported coal prices down to \$56/ton in Sep FY'24 from \$86/ton in Sep FY'23; Q2 Avg Coal inventory at 13 days
- E-auction Premium easing since January 2023. Down from premium of 182% over notified price in Jan'23 to 106% in Sep'23. Premium in May'22 had touched 425% and in Sep'22 was 276%
- > Imported Gas prices back to near levels seen two years ago. Average gas price at 13\$/MMBTU in Q2 FY'24; lower by 70% YoY
- > These factors are going to increase sell liquidity on the exchange

# With increase in power demand, Exchange prices are rising



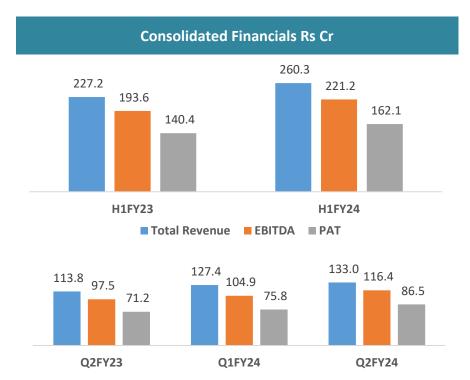




- ➤ While supply side has been easing; unexpected weather conditions increased power demand during monsoon months
- Q2 power demand higher by 13% YoY at 436 BUs; Peak demand for Q2 touched all time high of 239 GW
- > Average price of power up at Rs.5.88 kWh/unit from Rs.5.40 kWh/unit in Q2; an increase of nearly 9% over Q2'FY23; Price higher by 14% QoQ in Q2

### **Robust Financial Performance of IEX**





Breakup of standalone revenues (%)	Q2FY23	Q1FY24	Q2FY24
Transaction Fees	80%	78%	78%
Admission and Annual Fees	4%	4%	4%
Other Income	16%	18%	18%
Total	100%	100%	100%

Robust business model and financial strength

# **Customer Centric Technology and Product Strategy**



### **CUSTOMER CENTRIC**



#### Digital Experience

- ✓ Secure Web Access
- ✓ Integrated bids across segments
- ✓ Easy User Management for creating new Users and managing access for Users
- ✓ Web-based Financial Reconciliation for bids through our platform
- ✓ Web-based Data Insights for Bidding decision making

#### > Ease of Bidding

- ✓ Automated Bidding through API
- ✓ Bid Creation Tool
- ✓ Smart Power Procurement

#### Security

- √ 24\*7 Security Operating Centre (SOC)
- ✓ Cyber Security Framework

### **EFFICIENT**



#### Comprehensive Product Portfolio

- ✓ High Price Term Ahead Market (HP-TAM)
- √ High Price Day Ahead Market (HP-DAM)
- ✓ Longer Duration Contract + Additional Weekly Contracts
- ✓ Green Day Ahead Market (GDAM) +
  GDAM Hydro contracts
- ✓ Any-day(s) Single-sided Reverse Auction contracts (Conventional and Green)
- ✓ Cross Border Transactions

#### Automation

- ✓ Auto Carry Forward of Uncleared Bids
- ✓ Seamless DC-DR Transition to ensure business continuity
- ✓ Real Time reporting
- ✓ Alerts/Notifications
- ✓ SAP integration

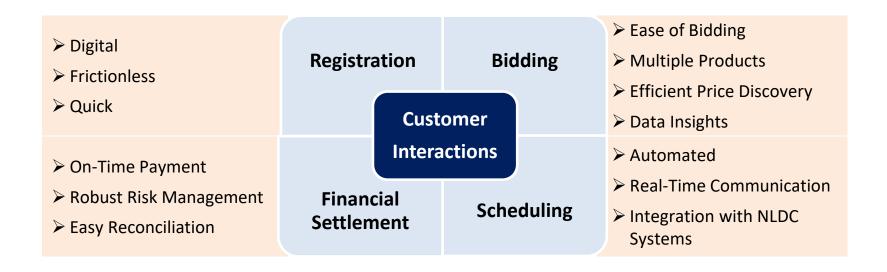
### STATE OF THE ART



- National Open Access Registry
  - ✓ Integration of NOAR
- Economic Surplus/Social Welfare optimization
  - ✓ MILP
- Data Insights
  - ✓ Bid Data Analytics for Senior Management
  - ✓ Power Market Data Analytics
  - ✓ Financial Reconciliation

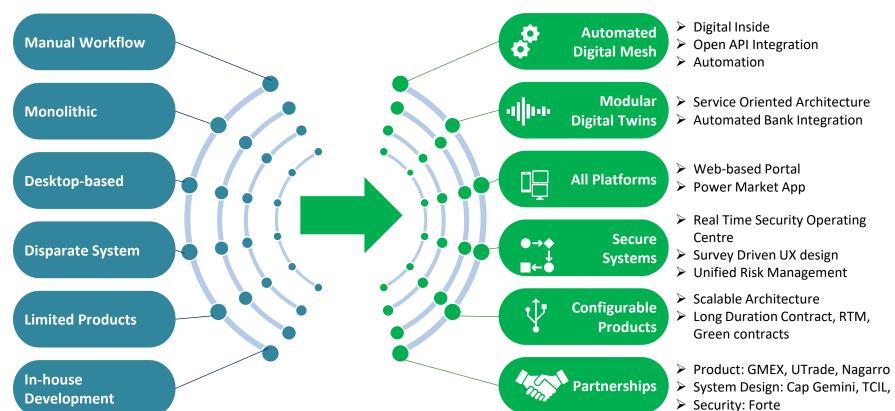
# **Creating Customer Delight for Each Interaction**





### **Transitioning Towards a Futuristic Tech Architecture**





### **Launch of IEX Academy; Price Index - PowerX**





- ✓ Launched in June to create pool of skilled professionals for capacity building in the power market. Nearly 250 enrollments across programs in first 3 months.
- Certification courses to develop skills and expertise in Electricity Markets across topics such as power sector policies, regulatory frameworks, and power exchange operations
- ✓ Courses designed based on in-house experience of IEX, and in collaboration with academic institutions and think tanks.



- ✓ Launched IEX Power Price Index 'PowerX' India's first Electricity Price Index.
- ✓ Provides competitive benchmark signals and enable market participants to make more effective decisions.
- ✓ Calculated based on weighted average price of Day-Ahead Market and Real-Time Market.



# In this presentation:

**Sector in Transition** 

**Electricity Value Chain** 

IEX: Who We Are

### Indian Gas Exchange (IGX)

International Carbon Exchange (ICX)

Way Forward

# **Indian Gas Exchange (IGX)**



#### **VISION**

To lead India's transition towards a gas-based economy by architecting next generation solutions for natural gas trading and access



## **IGX** – Key Highlights



Q2 FY24 Business l	<b>Jpdates</b>
--------------------	----------------

### Strategic Partners

Q2 F124 Business Opdates			
Total Volume	19.5 Million MMBtu		
YoY (%)	262%		
Total number of trades	223		
No. of members	43		
Active clients	200+		















### Domestic Gas Ceiling Price

- Commenced trading on 23<sup>rd</sup> May'22
- > Traded Volume: FY'23 50.9 Million MMBtu; Q2 FY'24 16.9 Million MMBtu
- India's First Gas Index GIXI

### GIXI - IGX Gas Index





#### Launched on 19th December 2022

GIXI represents volume weighted average price for all gas traded on any day (excluding domestic ceiling price gas)

GIXI represents prices for all hubs; for regional hubs will be named as GIXI West etc.

For months, named as GIXI-Jan23 etc.

Helps market participants to know inland gas prices and take suitable decisions

GIXI is the precursor for the Gas Futures which will help stakeholder in hedging



Month Delivery Poi		oint	₹/ MMBTU	\$/MMBTU	% Change	Best Buy	Best Sell	
				Weste	rn Hub			
$\overline{}$	Oct-23	Mhaskal	MS	1103	13.3	-	-	-
$\hat{a}$	UCT-23	Suvali	sv	1055	12.7	-	-	-
	Nov-23	Mhaskal	MS	970	11.7	-	1000	-
				Southe	rn Hub			
	Sep-23	Gadimoga	GD	1007	12.1	-	-	-
	Oct-23	Gadimoga	GD	840	10.1	-	-	-
	Nov-23	Gadimoga	GD	840	10.1	-	-	-



#### Note

- 1) Monthly GIXI Cumulative Prices are delivery month-wise volume weighted average price
- 2) Overall prices are excluding ceiling price gas only when gas traded at ceiling price (CP)
- 3) For details of gas hubs and delivery points, please refer Circular No. 59
- 4) \$/INR conversion rate considered at 83
- 5) Last Domestic Gas Ceiling Price Auction held on 18 Sep 23 at INR 840/MMBtu
- Best Buy/Sell bid price in Rs/MMBtu

# **Opportunity**



### **Growth in Gas Demand will lead to opportunities for Gas Exchange & Other Stakeholders**

- ➤ Government's vision of increasing share of Natural Gas in total energy basket from ~6.3% to 15% by 2030 will increase gas consumption in the economy from nearly 160 MMSCMD to 500+ MMSCMD
- ➤ With completion of 11<sup>th</sup> CGD bidding round ~98% population will be covered in next 6 years
- > LNG terminal capacity is expected to grow from current 47.5 MMTPA to around 72 MMTPA in 3 years
- Transmission pipeline network is expected to grow from ~21,000 km to around 35,000 km in coming years
- Unified transmission tariff (three zone) implemented
- Implementation of new Access Code Regulations and Incorporation of TSO
- Declaration of CGD GAs as common carrier
- > Gol's push towards net zero carbon emissions by 2070 will lead to increase Natural Gas share in India's energy basket

Development of robust infrastructure along with ramp up in gas demand shall enable short term trading of gas in India.

# **Key Gas Market Enablers**



**Inclusion of Natural Gas under GST Incorporation of TSO Implementation of New Access Code Regulations Declaration of CGD Exclusivity (Open Access within CGD Areas)** Policy Steps to Accelerate Role of Natural Gas in India's Economy (Natural Gas usage over polluting fuels)



# In this presentation:

**Sector in Transition** 

**Electricity Value Chain** 

IEX: Who We Are

Indian Gas Exchange (IGX)

International Carbon Exchange (ICX)

Way Forward

# **International Carbon Exchange (ICX)**



- ➤ IEX formed a wholly owned subsidiary ICX, in December 2022 to promote voluntary carbon market; second diversification initiative after successful launch of IGX in 2020.
- ➤ Will help India achieve its target of reducing the emission intensity of its GDP by 45% by 2030 to limit global warming to 1.5 degrees Celsius.
- ➤ Will enable participants to buy and sell voluntary carbon credits at competitive prices through its transparent & reliable Exchange platform, thereby helping large corporates meet their ESG requirements.
- ➤ Today, large part of carbon transactions are only 20-25 per cent.
- Almost 500 million units of carbon credits are traded globally presently. By 2credits are traded on a bilateral basis, exchange 030, this is expected to be almost 1,500-2,000 million carbon credit units an increase of 3X/4X in trading volume (based on a study with McKinsey).
- ➤ By 2030, India will sell almost 200 million carbon credits, with demand from Indian corporations alone expected to be about 120-130 million



# In this presentation:

**Sector in Transition** 

**Electricity Value Chain** 

IEX: Who We Are

Indian Gas Exchange (IGX)

International Carbon Exchange (ICX)

Way Forward

# **IEX: Growth Drivers (1/3)**



Growth from
recently
launched
products

- > RTM: June'20
- > Green Markets: GTAM launched in Aug'20, GDAM launched in Oct'21
- > Cross Border: April'21
- > Term Ahead Market Up to 3-Months in June'22
- > HP-DAM (High Price-DAM): March'23
- > Ancillary Market launched: June'23
- ➤ HP-TAM: Oct′23

# New Products

- > RE capacity through exchanges; Contract for Differences; Deepen Ancillary Market
- ➤ Launch of Derivatives will provide price hedging opportunity and lead to lower volatility in prices thereby increasing liquidity in the spot market
- Capacity Market

# New Business

- ➤ IGX launched in 2020 and achieved breakeven within first year of operations. Robust volume growth over next 5 years expected
- ➤ ICX International Carbon Exchange wholly owned subsidiary incorporated in Dec'22. Exploring business opportunities in voluntary carbon credit market
  - ➤ Exploring Coal Exchange opportunity
  - ➤ Other opportunities in energy marketplace

### **IEX: Growth Drivers (2/3)**



Favorable Policy, Regulatory Initiatives	roadmap for Indian Power Market over Short, Medium and Long Term  > Spot markets share to increase to 25% as per Draft NEP 2021  > GNA Regulation, Sharing Regulations, Grid Code (Effective 1st Oct), Late Payment Surcharge Rules  > Pool based CfD mechanism for RE capacity addition through market  > Capacity Market to comply with resource adequacy obligation
Dallara Adama a a a a	<ul><li>Allow aggregators to participate in spot markets</li><li>Allow sale of un-requisitioned power on exchanges</li></ul>
Policy Advocacy	➤ Merchant RE capacity addition — 25% merchant capacity in all PPAs; PPAs should be of 10-15 years

**Coal Supply** 

- ➤ Government of India increased coal production to nearly 900 MT in FY23, on way to its 1.2 Bn tonne target by 2025-26 to further drive availability of coal; will lead to lower electricity prices on the Exchange
- Exclusive coal auction/allocation for Merchant Capacity

> Implement Gross Bidding on a voluntary basis

# Demand for Electricity

The electricity consumption grew by 9% in FY'23 and is expected to further increase by 6% in next 7 years

# **IEX: Growth Drivers (3/3) - Future Opportunities**



#### Virtual PPA's

- Financial instrument used by buyers/sellers to hedge electricity cost
- ➤ Buyer not obligated to undertake direct physical delivery of electricity from seller
- ➤ Seller sells generated power at Exchange; undertakes realization from Exchange
- ➤ Bilateral settlement takes place w.r.t. contract price; buyer gets green attribute
- ➤ IEX working with corporates like Amazon, Google etc. to implement such models

### Dispatchable RE, BESS, Green Hydrogen

- ➤ Market to play crucial role to support Firm & Dispatchable RE Tenders (Excess or Deficit)
- ➤ IEX working with SECI, MNRE to promote use of market options for Dispatchable tenders & BESS. SECI's storage tender (500 MW) provides for 40% open capacity which can leverage power exchanges
- ➤ Green markets (GDAM/GTAM) can be leveraged to procure RE power for green hydrogen production
- ➤ Grid scale BESS expected to play crucial role in large scale RE integration (CEA: 42GW/208 GWH by 2030)
- > Storage system will provide liquidity in peak hours

### **Contracts for Difference (CfDs)**

- ➤ CfD model beneficial for RE generators, provides long-term stable price to mitigate project development and finance risks
- ➤ Under market-based CfD mechanism for RE, power traded and scheduled at PXs at market prices
- ➤ Revenue to generator is guaranteed, termed as 'strike price', which is determined through auctions
- ➤ If discovered market price > strike price, generator pays difference to pool maintained by Government entity. If market price < strike price, pool pays difference to generator

### **P2P Trading**

- ➤ P2P trading of electricity is emerging in different parts of the world due to increasing number of Prosumers
- ➤ IEX through its MoU Partners ISGF & Power Ledger, Australia has been jointly exploring P2P opportunities in various states.
- ➤ The Guidelines have been issued in UP and draft guideline has been issued by DERC.
- > We expect to see lot of traction in this segment.





# Thank you



@IndianEnergy ExchangeLtdIEX





@indian-energy -exchange-limited

**Phone:** +91-120 4648100



Email: contact@iexindia.com



Website: www.iexindia.com