A MODERNIZED APPROACH FOR ENERGY DEMAND FORECASTING

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India requires accelerated deployment of renewable energy technologies to meet the needs of the nation's growing population of more than one billion people. A new approach to energy planning is critical to India's transition to a more self-reliant future, powered by renewable energy.

DEMAND FORECASTING

Distribution companies with highly precise energy forecasts will increase performance while providing reliable clean energy to consumers at an affordable cost.

Distribution companies traditionally base resource plans on Compound Annual Growth Rate (CAGR) and historical data trends. Through the Partnership to Enhance Clean Energy Deployment 2.0 Renewable Energy (PACE-D 2.0 RE), **the U.S. Agency for International Development (USAID) provides distribution companies in Assam and Jharkhand with a modernized approach to strategic energy planning.** The new approach helps distribution companies use statistically advanced techniques with a higher degree of accuracy. Better forecasts can optimize power procurement using renewable energy options, which is cheaper, cleaner, and requires less time to commission.

PACE-D 2.0 RE developed a customized demand forecasting Software and will train analysts, planners, and forecasters to effectively reap its full benefits. The software analyzes data beyond past usage and considers various economic and policy drivers as well as disruptive technologies. Using an advanced algorithm that is the first of its kind in India, the software creates forecast models for each consumer category by applying best-fit statistical and scientific methods such as trend analysis, CAGR, econometric, Autoregressive Integrated Moving Average (ARIMA), Artificial Neural Networks (ANN) and partial end use. The results create an hourly energy demand profile that informs medium- and long-term resource plans for up to 20 years. Distribution companies can then optimize procurement at least cost.

SOFTWARE HIGHLIGHTS

- Creates dynamic models that consider economic drivers, demographics, policies, and game- changing technologies

- Uses statistically advanced techniques such as econometrics, end-use, Autoregressive Integrated Moving Average (ARIMA), Compound Annual Growth Rate (CAGR), and Artificial Neural Networks (ANN)

- Provides advanced analysis and risk assessments

- Faster analysis despite larger data sets

- Higher precision in predicting demand

- Intuitive and user-friendly interface

- Available for DISCOMs at no cost

- Yearly and monthly forecasts with extrapolation at weekday, weekend and hourly projections

- Reduce power purchase costs by up to 10 percent
- Integrate renewable energy technologies with the grid more easily and with less risk
- Reduce stranded capacity
- Balance energy supply with consumer demand through better procurement planning
- Upskill planners of distribution companies

SOFTWARE OUPUTS

- Long-term forecasting provides estimates for all consumer categories in terms of million units (MUs) and annual peak demand (MW)
- Medium-term forecasting provides an hourly demand profile (MW) and seasonal energy demand (MUs), as well as weekday and weekend demand (MW & MUs)
- Probabilistic algorithm helps distribution companies select most likely scenarios

Consumer Data
Historical Demand Data
Weather Data
Demographic Variables
Econometric Variables
Policies
Drivers
- CPP & OA
- AT&C Loss
- DER
- EV
- DSM

Input

Algorithm

- CAGR
- Trend Analysis
- Econometric
- ARIMA
- ANN
- Partial End Use

Long-Term Forecast (Upto 16 yrs)
- Annual Energy Consumption (MU)
- Annual Peak Demand (MW)

Medium Term (3 to 5 yrs)
- Seasonal/Monthly Energy Forecast (MU)
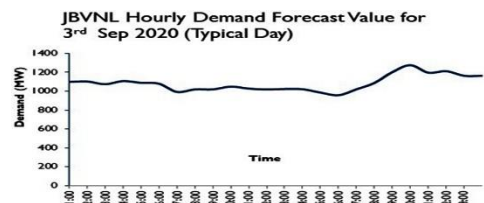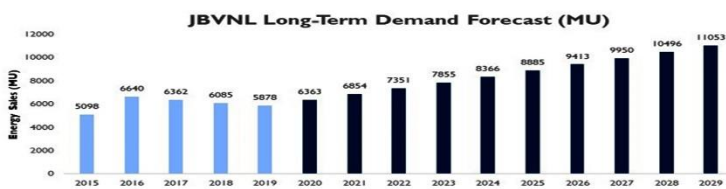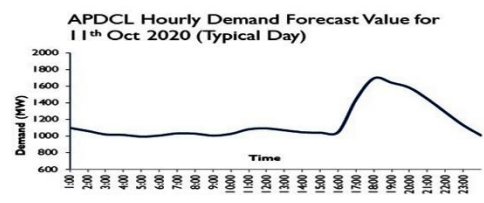- Seasonal/Monthly Peak Demand (MU)

Load Profile (Medium- & Long-Term Horizon)
- Hourly load profile (MW)
- Weekday/Weekend Demand (MW & MU)
- Demand Statistics

Output

SAMPLE OUTPUTS

APDCL Long-Term Demand Forecast (MU)

APDCL Hourly Demand Forecast Value for 11th Oct 2020 (Typical Day)

JBVNL Long-Term Demand Forecast (MU)

JBVNL Hourly Demand Forecast Value for 3rd Sep 2020 (Typical Day)

ABOUT PACE-D 2.0 RE PROGRAM

Through PACE-D 2.0 RE, USAID works with the Ministry of Renewable Energy to help national and state partners provide reliable clean energy to consumers at an affordable price. PACE-D 2.0 RE partners with distribution companies (DISCOMs) from Assam, Jharkhand, and Gujarat to adopt innovative approaches to DISCOM resource energy planning, develop profitable business models and approaches that accelerate the deployment of grid-connected solar PV technologies, and cost-effectively procure renewable energy. PACE-D 2.0 RE will scale its solutions to non-partner state DISCOMs throughout the country, enabling better planning, quality, and safety of solar PV by working with state and national governments to strengthen energy sector regulations. For more information, visit https://www.pace-d.com/.

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