

## Adapting the Load Forecasting Project to GIFT City (Gujarat) and Amaravathi (Andhra Pradesh)

You can adapt the `pyaf/load_forecasting` project to greenfield cities like GIFT City and Amaravathi. Here's an overview of what's involved and important considerations:

### 1. Data Availability

#### GIFT City, Gujarat

- As a recently developed greenfield smart city, GIFT City does not have the extensive historical load data like established metros. However, Gujarat's State Load Dispatch Center (SLDC) conducts load forecasting for the state, and studies have used load data from SLDC Gujarat in prior research<sup>[1] [2] [3]</sup>.
- GIFT City has its own power distribution company (GIFT Power Company Ltd), which may maintain granular load and consumption records for the city's zones<sup>[4] [5] [6]</sup>.
- For a capstone or research project, you can start by:
  - Using Gujarat state load data as a proxy if granular city data isn't accessible.
  - Requesting load or energy consumption data from GIFT City administration or the power company.

#### Amaravathi, Andhra Pradesh

- Andhra Pradesh's SLDC and power utilities employ machine learning and AI for day-ahead and granular forecasting, and they routinely analyze load at the state, district, and substation levels<sup>[7] [8] [9] [10]</sup>.
- Average and peak load demand data are publicly discussed (daily demand, peak loads, etc.), but fine-grained new-city data may require outreach to local authorities.
- Amaravathi, as a planned capital, may collect and release utility data under state digital transparency initiatives<sup>[11]</sup>.
- As with GIFT, you can use state-level or regional load data if city-specific records are unavailable.

### 2. Project Suitability

Criterion	GIFT City	Amaravathi
Domain Fit	Yes – smart/greenfield city, focus on sustainability, grid optimization	Yes – rapidly developing, focus on efficient grid development

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<b>Data Granularity</b>	State/regional data easily available; city-level may require formal request	State/regional data easily available; new-city granularity may require outreach
<b>Implementation Ease</b>	Models in <code>pyaf/load_forecasting</code> are flexible for time series, load prediction, and can train on any similar dataset	Model directly applicable using Andhra Pradesh load data sources
<b>Research Value</b>	High – opportunity to study load trends in planned smart cities, optimize new urban grids	High – potential for scenario modeling and their application to new cities

### 3. Steps to Adapt the Project

- **Obtain Data:**  
Contact the respective SLDCs or city utility companies for local load data. Otherwise, start with regional/state-level time series.
- **Preprocessing:**  
Format the data to match project requirements (CSV, time series with datetime index, etc.).
- **Model Training:**  
Use existing notebooks for ARIMA, LSTM, GRU, or classical models. No need for complex code changes if data structure remains consistent.
- **City-Specific Features:**  
Add context features if possible (e.g., weather, major events, unique consumption patterns in smart cities).
- **Future Improvements:**  
Incorporate greenfield-specific changes, renewable integration trends, or emerging smart grid functionalities.

### 4. Challenges & Opportunities

- **Challenge:** Direct, granular load data for new greenfield cities may not be readily published but is often collected internally <sup>[5]</sup> <sup>[6]</sup>.
- **Opportunity:** There's unique research value in forecasting load for planned cities, where consumption trends can differ from conventional urban settings. Applying and benchmarking models in these environments is novel and can influence infrastructure decisions <sup>[7]</sup> <sup>[10]</sup>.

### 5. Conclusion

You **can** successfully adapt the electric load forecasting project for GIFT City and Amaravathi. If public, granular data is limited, work with SLDC/state-level data or seek research/smart city partnerships for access. The approach remains nearly identical: load forecasting pipelines are data-driven and flexible, allowing use of any new-city time series data as input, making this an excellent capstone or research project for emerging urban centers.

1. <https://www.slideshare.net/slideshow/short-term-load-forecasting-one-week-with-without-weekend-using-artificial-neural-network-for-sldc-of-gujarat/72687133>
2. <https://www.ijltemas.in/DigitalLibrary/Vol.6Issue2/32-37.pdf>
3. [https://www.academia.edu/31656447/Short\\_Term\\_Load\\_Forecasting\\_One\\_Week\\_With\\_and\\_Without\\_Weekend\\_Using\\_Artificial\\_Neural\\_Network\\_for\\_SLDC\\_of\\_Gujarat](https://www.academia.edu/31656447/Short_Term_Load_Forecasting_One_Week_With_and_Without_Weekend_Using_Artificial_Neural_Network_for_SLDC_of_Gujarat)
4. <https://www.indiamart.com/gift-power-company-ltd/>
5. [https://api.giftgujarat.in/public/downloads/Others/GIFT\\_PCL\\_MYT\\_Petition\\_2024.pdf](https://api.giftgujarat.in/public/downloads/Others/GIFT_PCL_MYT_Petition_2024.pdf)
6. [https://en.wikipedia.org/wiki/GIFT\\_City](https://en.wikipedia.org/wiki/GIFT_City)
7. <https://www.newindianexpress.com/states/andhra-pradesh/2020/Dec/28/forecast-of-energy-use-made-easy-in-andhra-with-the-help-of-artificial-intelligence-2242100.html>
8. <https://energy.economictimes.indiatimes.com/amp/news/power/andhra-to-witness-high-power-demand-till-november-chief-secretary/121246036>
9. <https://energy.economictimes.indiatimes.com/news/power/andhra-to-witness-high-power-demand-till-november-chief-secretary/121246036>
10. <https://indiaai.gov.in/news/andhra-pradesh-forecasts-energy-needs-using-ai>
11. <https://www.worldbank.org/en/country/india/brief/world-bank-support-for-amaravati-as-a-growth-hub-in-andhra-pradesh>