



SAARC Training Workshop Program

“Identification, Comparison and Scenario Based Application of Power Demand/ Load Forecasting Tools”

Power Market Survey Model



What Is Power Market Survey Forecasting?

- It involves applying 'Per Customer Growth Rates' and 'Field Survey' to find out following future loads:
 - Industries
 - Commercial Buildings
 - Villages
 - Housing Schemes
 - Other Load



Significance and Applications

- Mainly used for power system analysis
- Provides basis for generation, transmission, transformation and distribution planning
- Provides technical justification for system expansion plans
- Project financing arrangements require solid forecast modeling (as PMS)

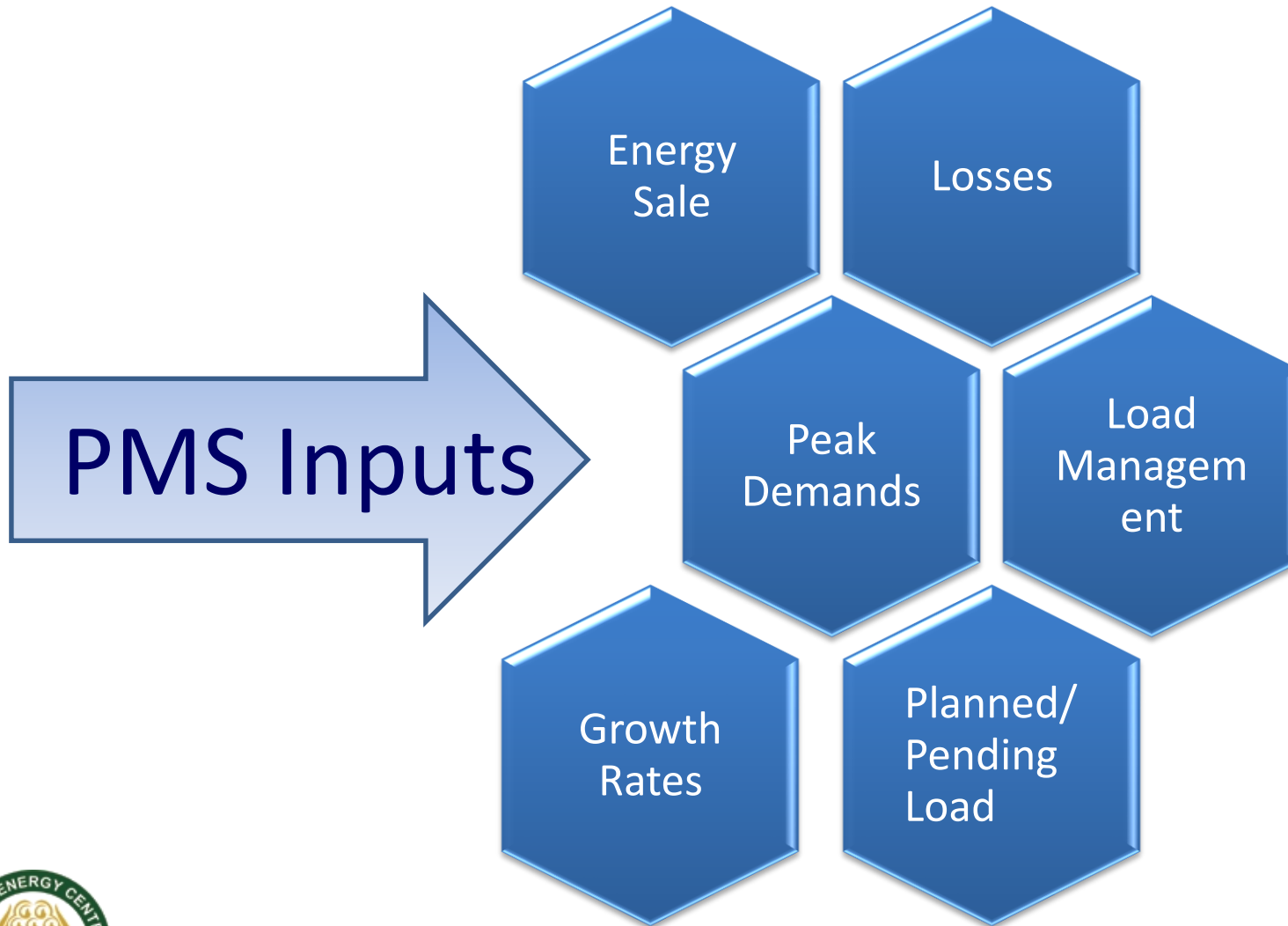


PMS Model Architecture

- The model has three interrelated components:
 - Input Parameters
 - Calculations
 - Results



Input Parameters



Input Parameters...*Continued*

Energy Sale (GWh)

Domestic

Commercial

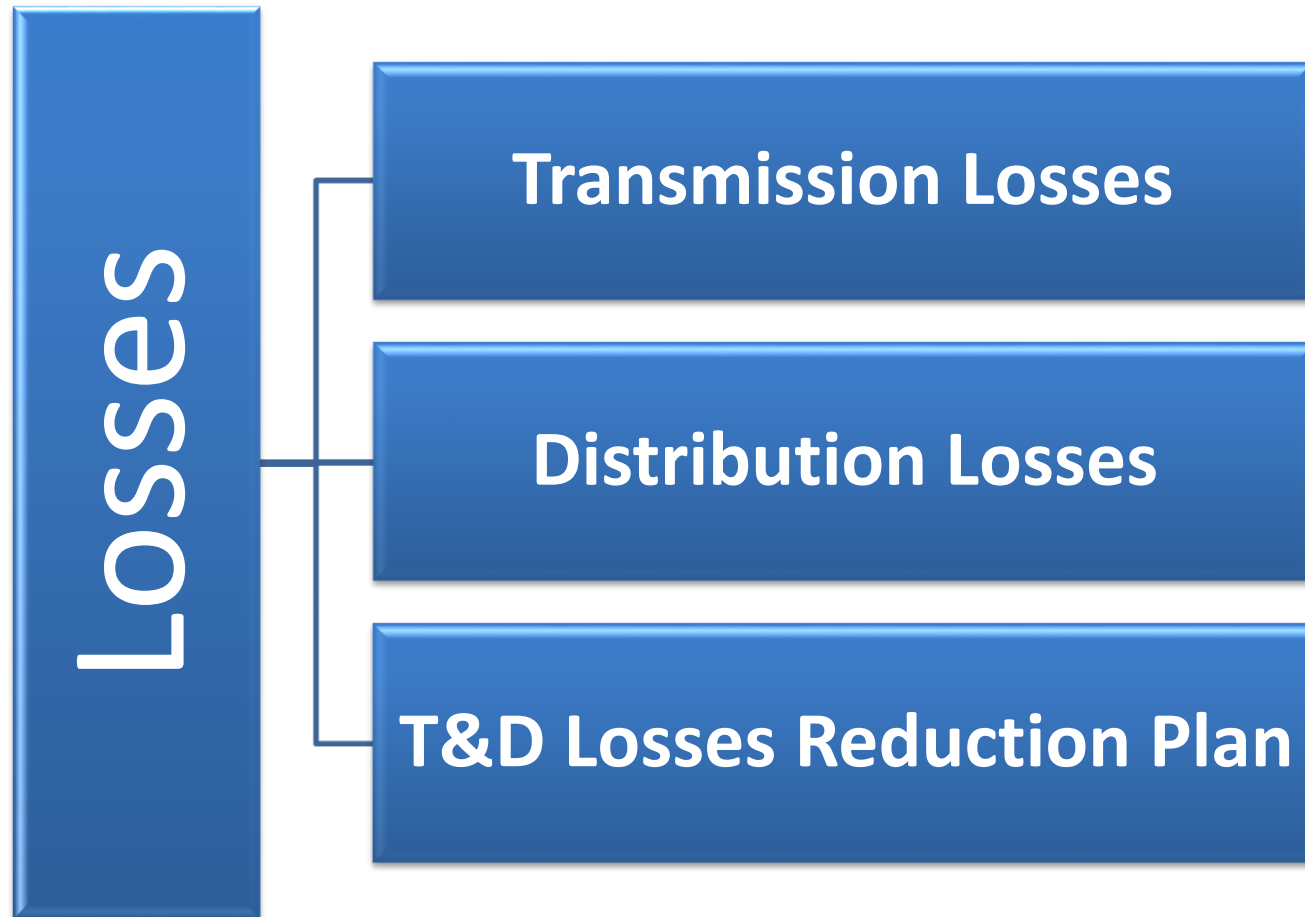
Agriculture

Industrial

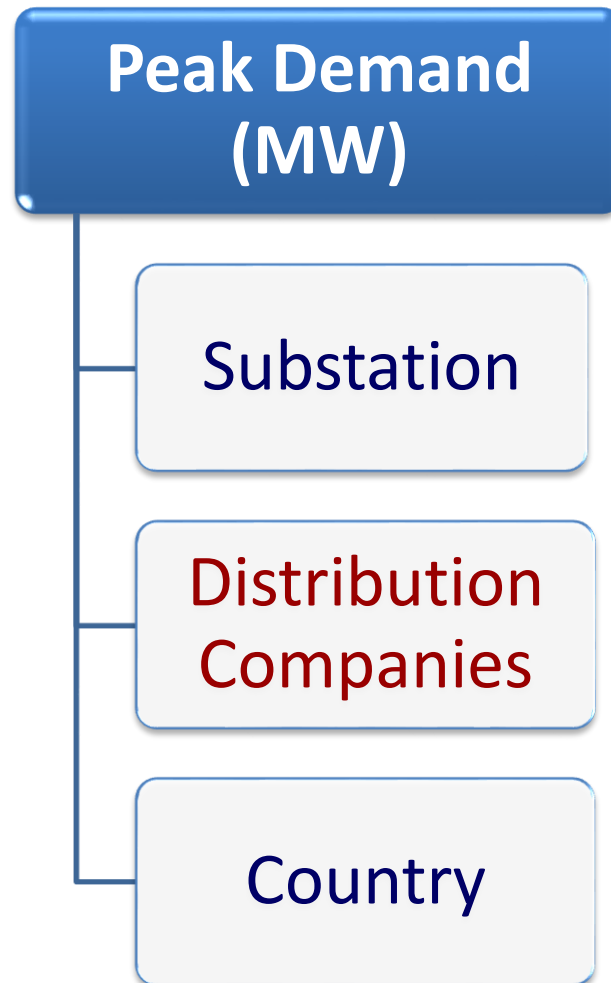
Public
Lighting



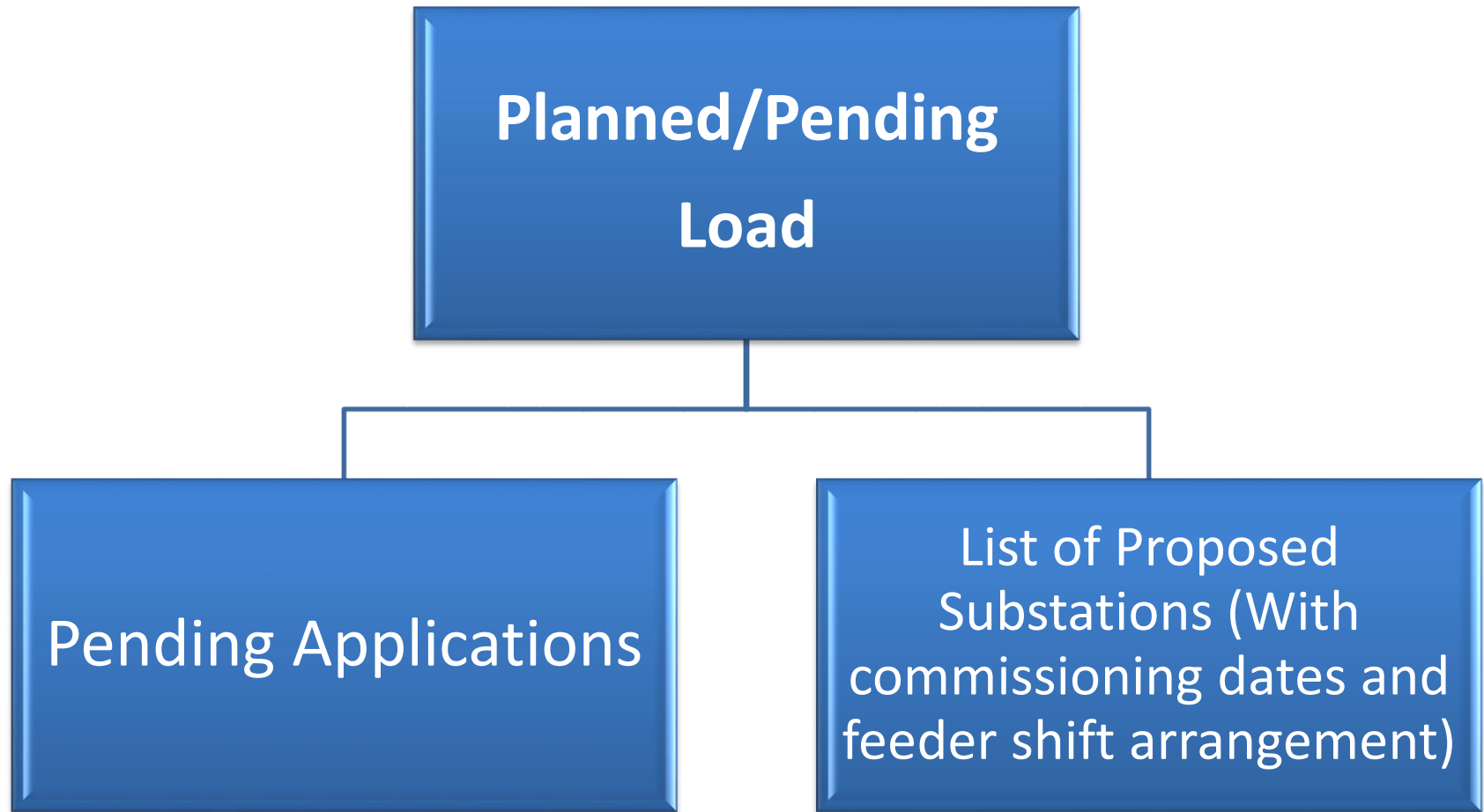
Input Parameters...*Continued*



Input Parameters...*Continued*



Input Parameters...*Continued*



Input Parameters...*Continued*

Growth Rate

**Last five years
number of
customers for
each category**

**Last five years
customer class
wise energy sale**



Input Parameters...*Continued*

Load Shedding



Load Factor

- The load factor is defined as the average load divided by the peak load in a specified time period.

$$\text{Load Factor} = \frac{\text{Total Energy (KWh)}}{\text{Peak Demand (W)} * \text{No. of Hours}}$$



Coincidence Factor

- Coincidence factor is the ratio of the maximum demand of the whole system (or part of the system) under consideration to the sum of the individual maximum demands of the various subdivisions of a system.
- Coincidence factor is usually less than 1.

$$\text{Coincidence Factor} = \frac{\text{Maximum Demand of Company (MW)}}{S_1 + S_2 + S_3 + S_4 + \dots (\text{MW})}$$



Diversity Factor

- Diversity factor is the ratio of the sum of the individual maximum demands of the various subdivisions of a system to the maximum demand of the whole system (or part of the system) under consideration.
- Diversity factor is usually more than one.

$$\text{Diversity Factor} = \frac{S_1 + S_2 + S_3 + S_4 + \dots (MW)}{\text{Maximum Demand of Company (MW)}}$$



Calculations

Load Factor

- Calculated by study
- Used to calculate peak demand from Energy

Diversity Factor

- Required to Find Combined Peak
- Within Sub-Stations of each DISCO

Assumptions

- The load factor of the entire period is the same as that of the base year.
- Coincidence or diversity factors between feeders of different categories of each respective Disco are determined by survey.

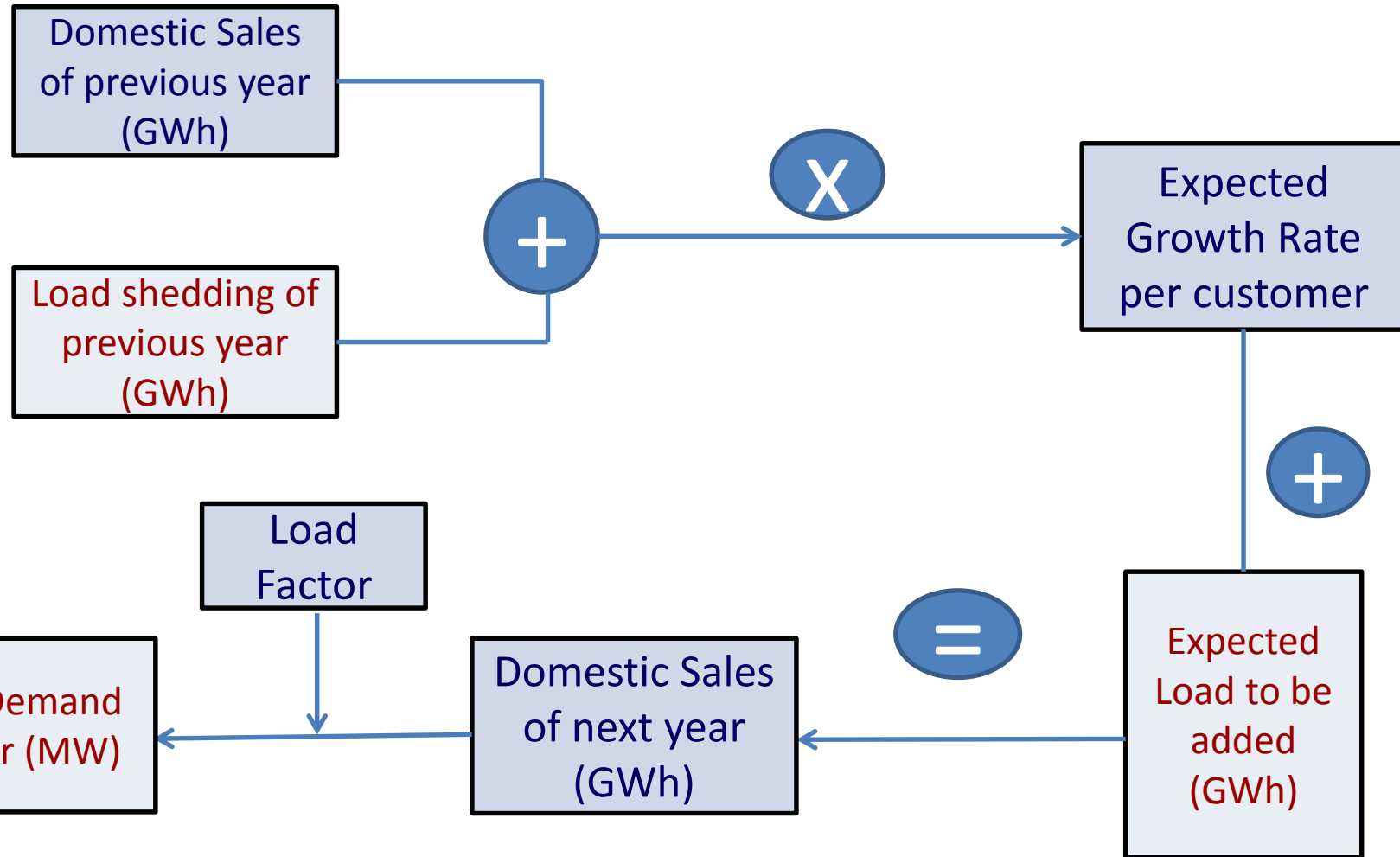


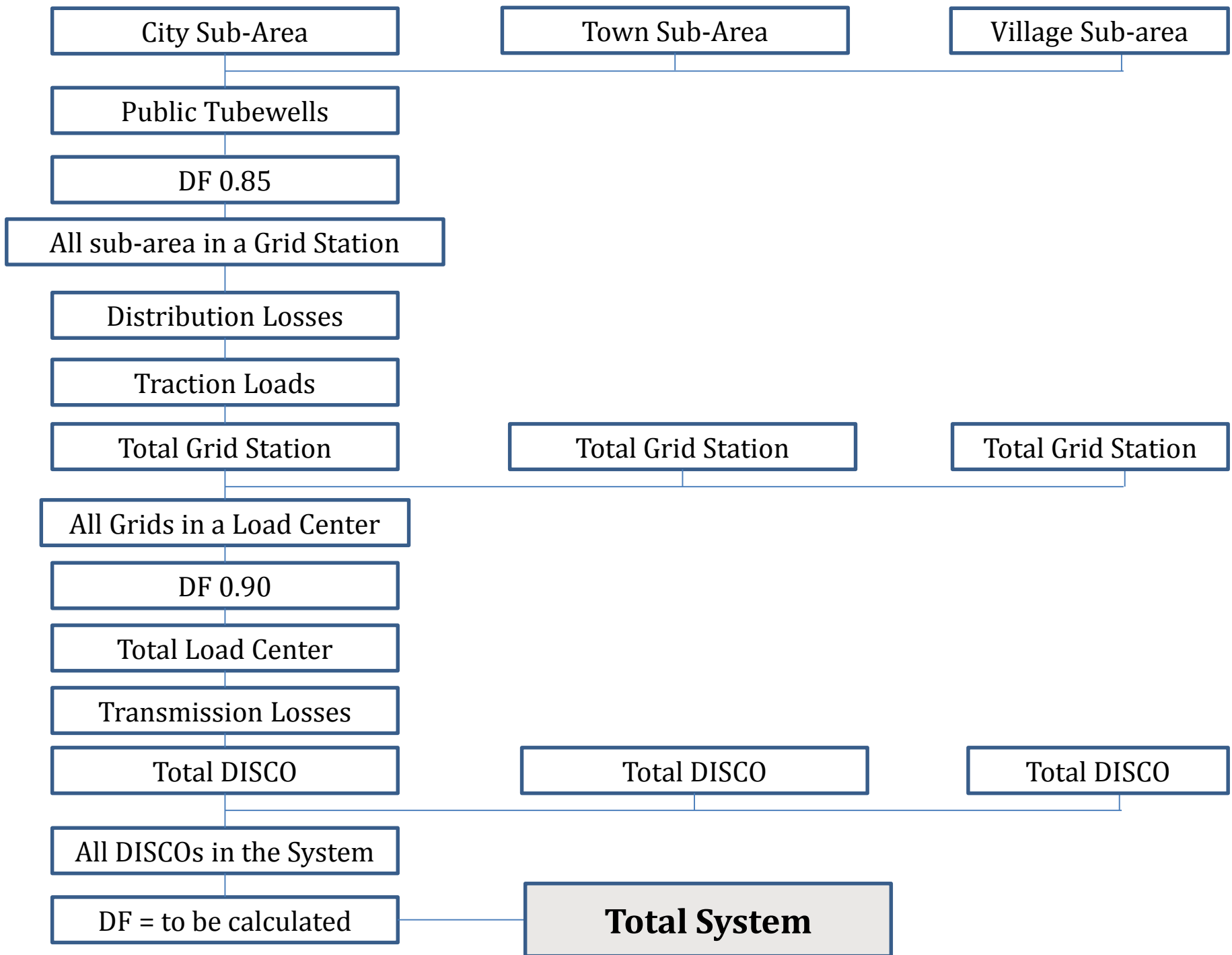
Assumptions

- The percentage of Load Shedding in all the Discos is the same.
- Coincidence or diversity factors between transformers, sub-stations and Discos are the same as that of the base year.

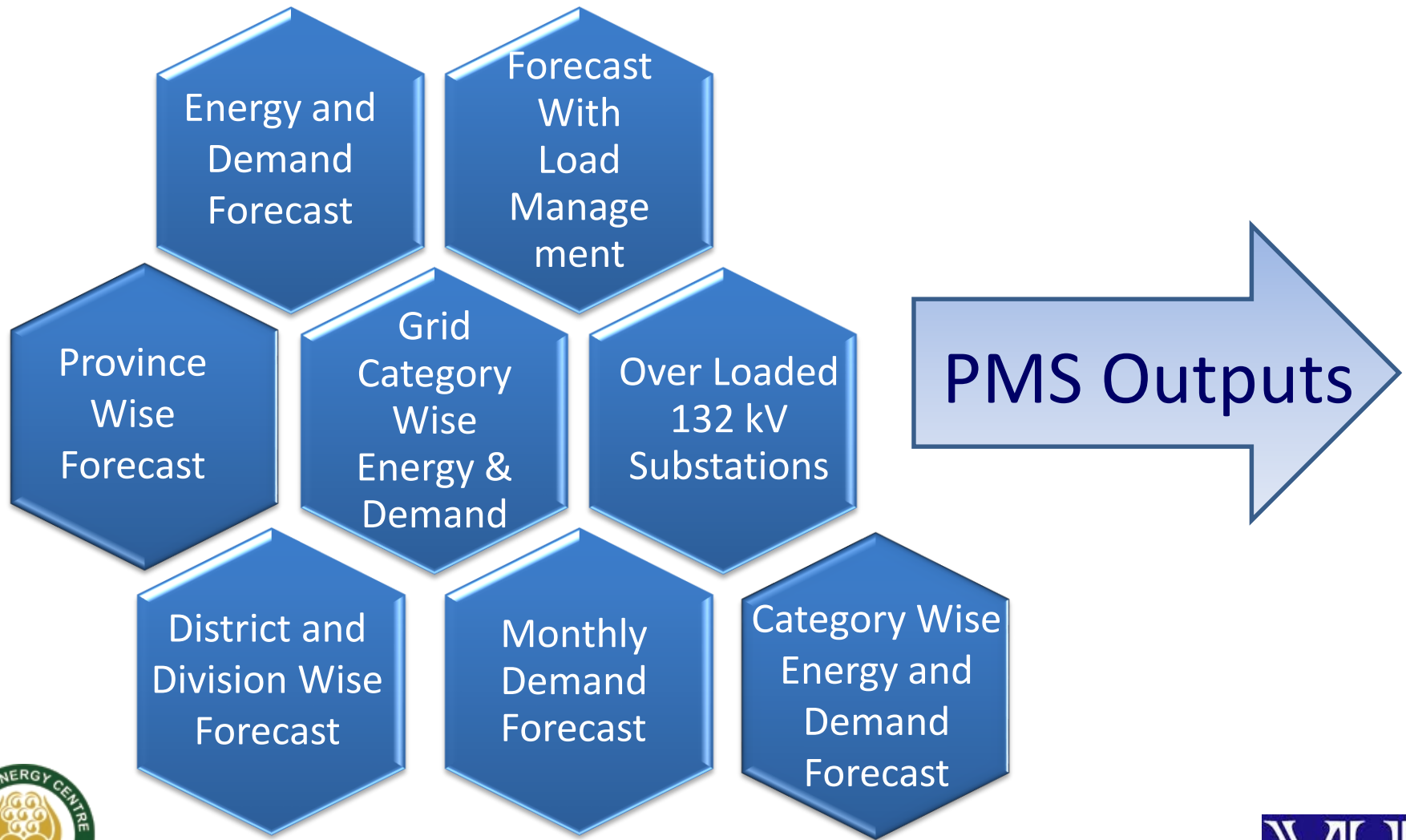


Domestic Sales Equation





Outputs



Summary of Demand Forecast (MW)

Name	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
LESCO	4326	4478	4649	4855	5063	5271	5495	5736	5976	6210
GEPCO	2093	2198	2324	2439	2560	2686	2818	2957	3102	3254
FESCO	3013	3216	3427	3651	3886	4167	4480	4807	5127	5450
IESCO	2389	2481	2621	2754	2894	3047	3201	3354	3509	3669
MEPCO	3299	3499	3734	3949	4170	4399	4636	4894	5161	5438
PESCO	2645	2754	2865	2976	3089	3202	3316	3431	3547	3663
HESCO	1421	1496	1574	1656	1742	1831	1926	2024	2128	2236
QESCO	1288	1332	1377	1425	1474	1525	1579	1635	1693	1753
TESCO	641	662	682	704	726	750	774	799	825	852
SEPCO	1070	1122	1176	1232	1290	1350	1412	1476	1542	1611
Total DISCOs Demand	19545	20473	21523	22590	23695	24871	26112	27412	28730	30075
T & T Losses (500 & 220kV) (Avg 3.05%)	626	655	689	723	759	796	836	878	920	963
NTDC Demand	20171	21129	22212	23313	24453	25667	26948	28290	29649	31038
Auxiliary Consumption	345	361	380	398	418	439	460	483	507	530
PEPCO Demand w/o KESC	20516	21490	22592	23711	24871	26105	27408	28773	30156	31568
PEPCO Demand w/ KESC (650 MW)	21166	22140	23242	24361	25521	26755	28058	29423	30806	32218

650 MW



THANKS