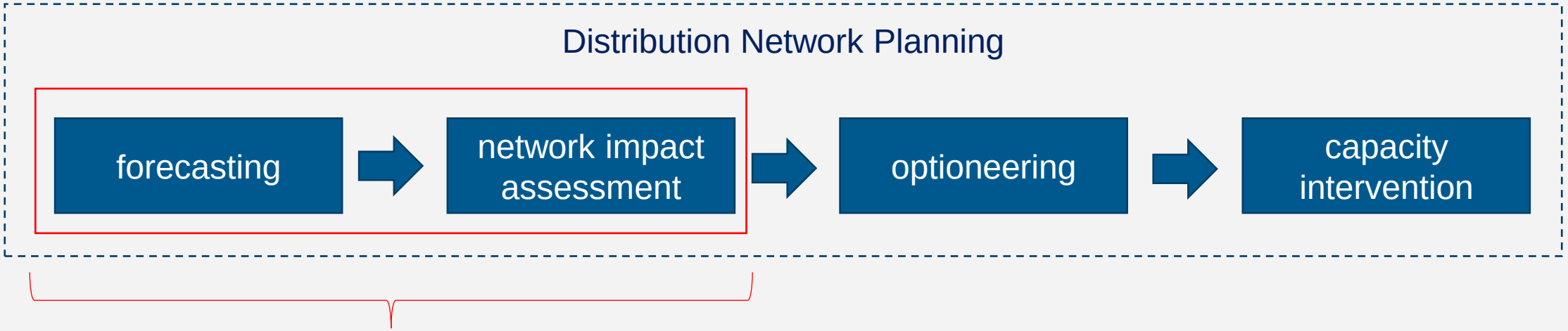
Best Practice Recommendations

ENA Open Networks

WS1B P2 Whole System Future Energy Scenarios

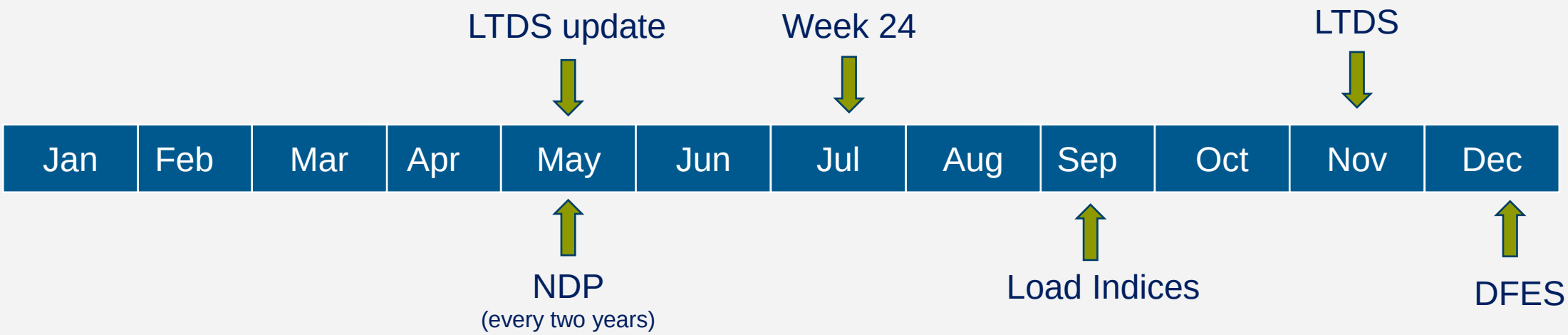
September 2022

Overview of the network planning process



This report provides best practice recommendations on the use of forecasting outputs in network impact assessments used in the Network Development Plan.

Annual DSO reporting on network planning



Focus on forecasts used as inputs to inform Network Development Plans (NDP)

- Forecasting outputs are reported in several annual reporting & network planning processes including Distribution Future Energy Scenarios (DFES), Week 24 submission to ESO/TO and Long Term Development Statement (LTDS). These outputs are for data used in network planning and other data worth sharing with stakeholders.
- This report focuses on forecasting outputs that are used as inputs in network impact assessments. Results of network impact assessments such as the capacity headroom information is presented in the Network Development Plans (NDP) for all DFES scenarios.

Focus on use of forecasting outputs in network planning

Best practice recommendations

- aim to provide high level recommendations in what forecasting outputs should be used as inputs to impact assessments in distribution network planning
- recommendations focus more on requirements for forecasting outputs rather than detailed network planning methodologies/standards

Areas of network impact analysis

- thermal stress
- over- & under-voltage
- fault levels
- harmonic distortion

Relevant forecasting outputs:

- electricity demand
  - peak & min demand
  - half-hourly profiles
  - annual/seasonal energy
- distributed generation & batteries
  - installed capacity per type & voltage level
- volumes of low carbon technologies (LCTs)
  - EVs, heat pumps

Best practice recommendations for network planning - focus on Network Development Plans

Recommendations

- capacity headroom forecasts: similarly to ER P2/7 assessments, use of forecasts of seasonal peak true demand per BSP and primary substation is recommended. To assess true demand, it is recommended that the demand suppressed by local generators is quantified using measured generation and estimates for non-monitored generation.
- fault level assessments: forecasts of fault currents need to consider forecasts of the different DG types and the associated voltage level of their connection to network. Recommendation to:
  - for accepted DG & battery connections: use where available detailed info – eg inverter or non-inverter connected, connection with or without a step-up Tx, network location – to quantify its impact on fault levels
  - for longer-term DG & battery forecasts: allocate the forecasted DG capacity per voltage level and whether they're expected to be inverter/non-inverter connected. Then consider typical contribution to fault level data to quantify effects.

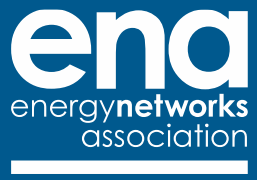
Best practice recommendations for network planning - focus on Network Development Plans

Best practice recommendations

- for identification of cyclic vs continuous asset rating: it is recommended to use seasonal half-hourly observed demand profile forecasts to identify changes in future asset ratings to quantify associated effects on seasonal network capacity
- for the long-term forecasting of flexibility service requirements: it is recommended to use half-hourly through year demand profile forecasts to quantify the flexibility service availability requirements in annual MW and MWh including half-hourly through year MW.
- reverse power flows: forecasts of seasonal minimum true demand should be combined with maximum local generation outputs to identify worst network impact in reverse power flow cases
- best practice recommendations to be followed by all DNOs from their 2022 forecasting cycle to produce DFES 2022 and onwards

Summary of best practice recommendations

Forecasting Output	Network Planning Process	Details on forecasting outputs
Seasonal peak true demand	Capacity headroom	True demand assessment considering both monitored and non-monitored generation.
Half-hourly true and observed demand profiles	Flexibility service requirements, identification of asset rating (cyclic/continuous)	Half-hourly profiles need to capture seasonal variations
Annual min true demand	Reverse power flows	Annual min true demand to be combined with maximum possible local DG output
Installed DG and battery capacity per type and voltage	Fault level assessments	Forecasts of inverter vs non-inverter connected DG as well as per voltage level required to improve fault level forecasts



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