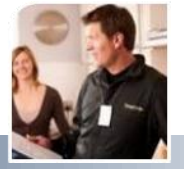
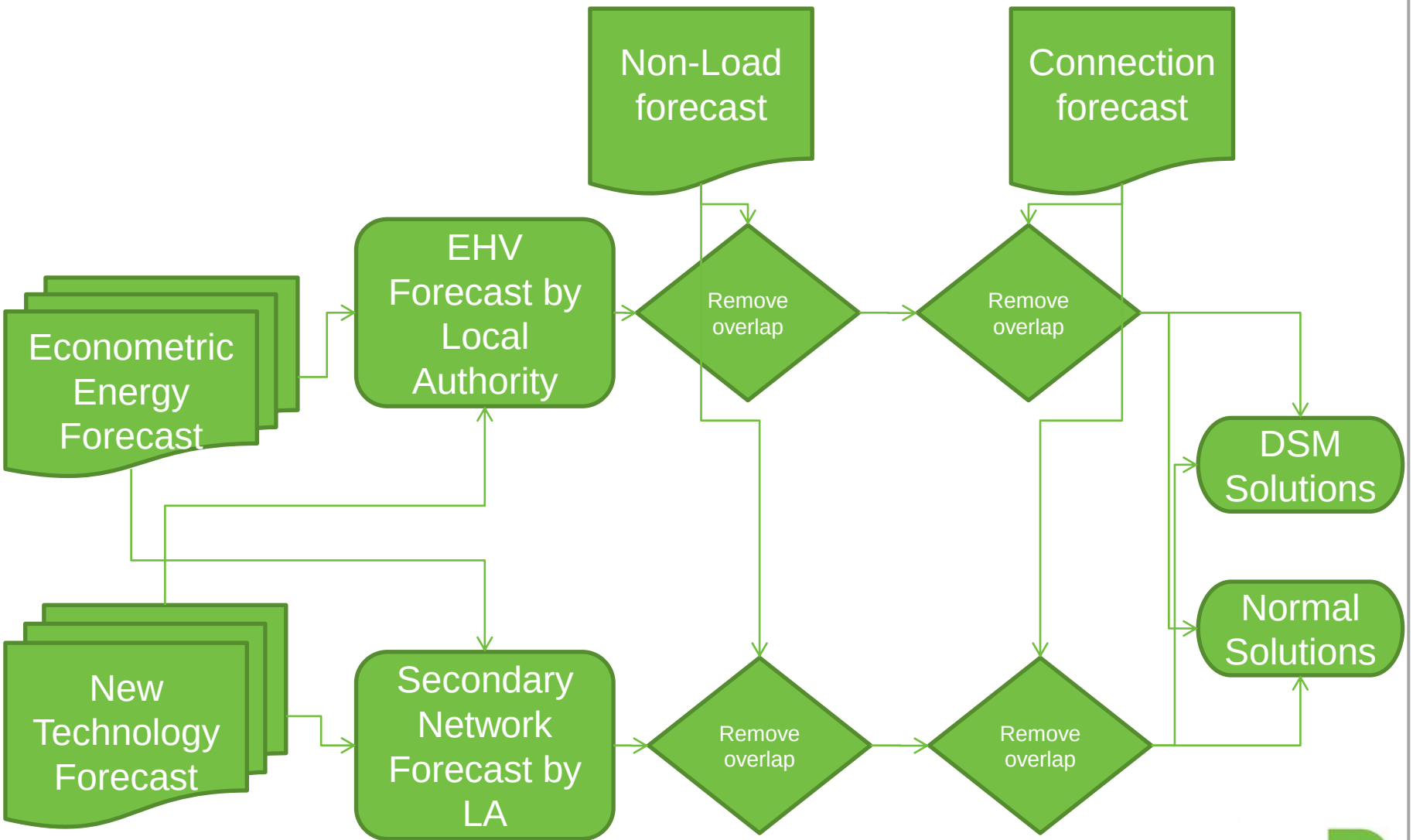
Possible high-level approach to reinforcement forecasting and uncertainty management for 2012 forecast submission

Presentation to Flexibility and Capacity Working Group

9 May 2012


Reinforcement Forecasting Process



Econometric Energy Forecast

- Central energy forecast per Local Authority (LA), reflecting trends in economic growth and customer growth in each LA area using new connections and national energy efficiency trends
- Domestic and non-domestic trends in the last two years of RIIO-ED1 extended throughout RIIO-ED2 to 2030/31
- EHV - Adjust for actual units distributed; Primary and EHV customer correspondence to each LA
- Baseline demand growth broadly flat in ED1
- Secondary Network - Base scenario per LA split by domestic, non-domestic, existing and new customers for application at granular level, reflects impact of smart metering on reducing domestic peaks.

New Technology Forecast

- EV, PV and HP by LA consistent with DECC's Carbon Plan nationally, but at levels appropriate for each LA in our region e.g. taking account of relatively low levels of existing EV infrastructure, of solar irradiation / PV uptake and of off-gas properties
- EV take-up -Transport Research Lab central scenario
- PV and HP take-up - Tyndall Centre at the University of Manchester. Linked to national PV uptake at DECC's Level 2. Linked to HP uptake to the WS2 'Central case' for 2022 consistent by 2030 with CCC 4th budget report.
- Micro-CHP not included as insignificant in DECC Carbon Plan.
- Technology scattering / clustering approach

Justification of Load Scenarios – Grid & Primary

- Base case for peak demand = baseline component + incremental component
- The baseline component combines forecasts by BSP for peaks and load factors (both based on historic trends) with an econometric energy forecast
- The incremental component adds EV and HP load at peak by BSP. PV is assumed irrelevant to peak load.
- Peak demand applied to all load groups and analysed against firm capacity to derive LI score. Fault level assessment also carried out.
- Seek to intervene and address all LI5 issues and fault level greater than rating issues. DSM payments and normal reinforcement techniques considered.

Justification of Load Scenarios – Secondary Network

- Initial load estimates for each asset from IFI Load Allocation Model: combines and filters various data sources across LV and HV
- Load assessed for normal running on peak day of associated primary
- Future Capacity Headroom (FCH) model of entire LV and HV network, peak loads in 2014/15 and 2022/23 based on input scenarios per local authority (LA) for customer / background demand growth, and EV/HP/PV percentage uptake, plus new technology clustering and profiles
- Compares peak load with thermal rating, counts number of assets exceeding a loading threshold. Also suggests when voltage / harmonics issues occur at LV
- Fault level intervention requirements also addressed

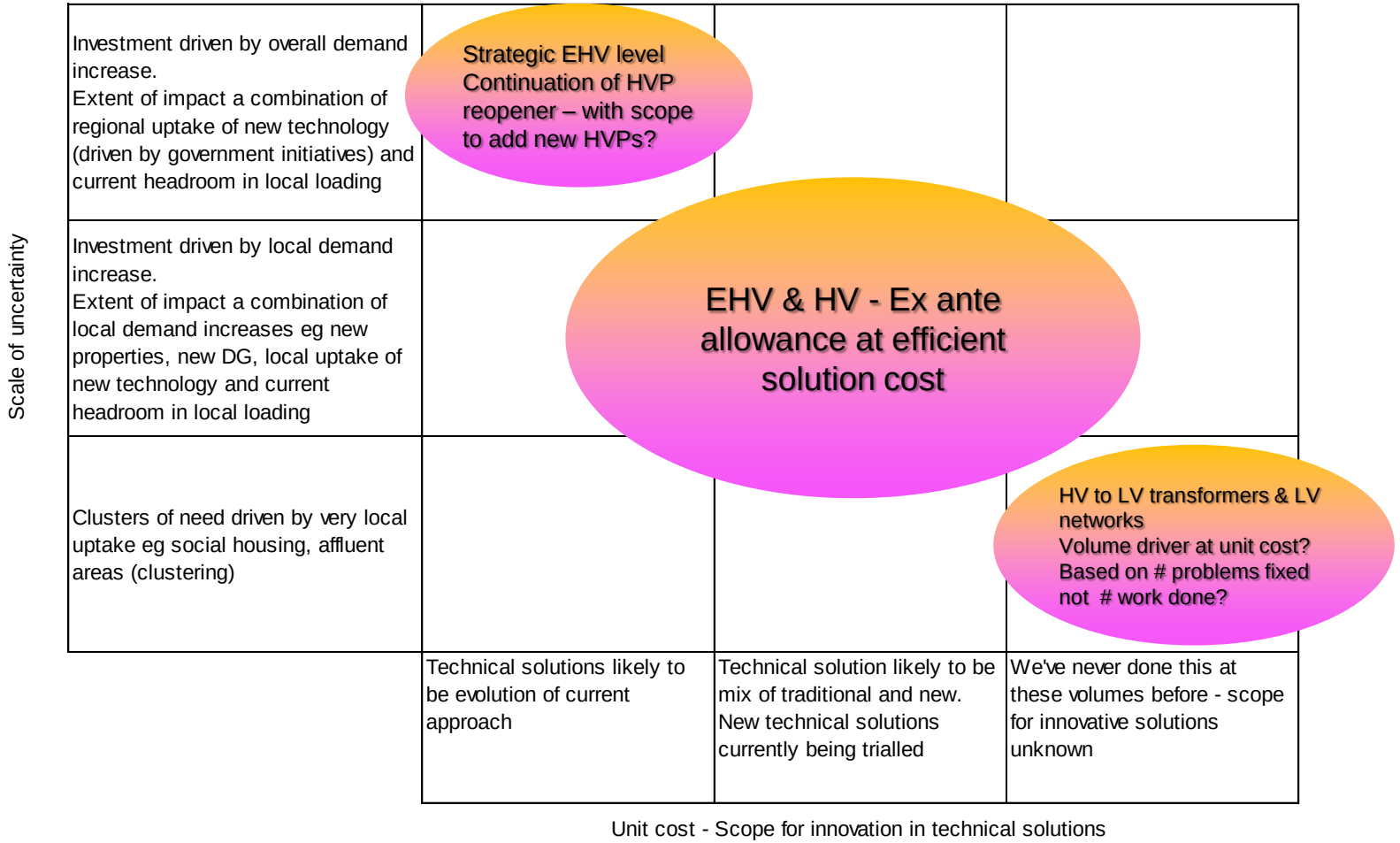
DG Connection Forecast

- Separate DG connection forecast developed
- Based on DECC Carbon Plan, regional resource assessments and connection trends
- Consistency with New Technology Forecast for PV ensured
- Inter-actions with load-related, non-load and demand connections forecasts undertaken and overlaps removed

Appropriate Outputs & Targets

- DPCR5 focussed on broadly maintaining the current level of risk, measured by LIs (i.e. by achieving an agreed LI=5 count at DPCR5 exit)
- For RIIO-ED1 main Output should be the timely delivery of efficient level of network capacity
  - Target is the delivery of required change in Load Index across the network (132kV to LV)
  - Measure is to ensure exit RIIO-ED1 with no groups at LI=5 constraining connections, change in LI=4 as leading indicator
  - This requires comparable LIs across DNOs
- As with DPCR5, DNOs manage risk of changes in population of circuits at LI=5 within an ex-ante allowance
- Need to understand interaction with a speed of connection incentive, but can be a separate mechanism

Are uncertainty mechanisms required?



- Impact of uncertainty is different at different voltages
- Lots of options but no obvious single best fit mechanism
- Risk of new boundary creation
- Would benefits of multiple mechanisms justify extra complexity?

Uncertainty mechanisms – HVP recommendation

- Major 132kV and strategic level EHV reinforcement only
- Very large projects are generally subject to much larger uncertainties than smaller projects due to, for example, planning constraints and complexity of projects
- Recommend continuation of DPCR5 mechanism with following changes
  - Threshold should be inflated to £20m
  - For ex ante funded projects (reasonable certainty of going ahead) variations in spend of ± 20% subject to adjustment mechanisms - but if project does not go ahead at all 100% monies returned to customer
  - List of possible additional HVPs agreed at price control with specific triggers allowing funding if uncertain projects go ahead
  - Companies should be able to nominate new HVPs at mid period review (ie not on original list of projects)
  - Project size should be assessed across all years that spend will be undertaken and not artificially constrained within one price control period
  - Separate mechanism for every high value project planned by a company - as opposed to combining disparate projects into one mechanism

Uncertainty recommendation – LV clusters

- Define measure of a qualifying cluster/problem in terms of LV network/transformer loading
- DNOs establish minimum level forecast for clusters based upon consistent scenario
- Develop volume driver mechanism based on problems fixed rather than work done
- Encourage innovation and efficiency by providing fixed cost per problem removed