GCDF – New parameters for Storage

02 Aug 2023

ESO

Background

The Balancing Programme

- The ESO has initiated a programme to update the tools and capabilities within the control room in readiness for net-zero operation
- Details of the programme can be found at the following location [Strategic capability review | ESO (nationalgrideso.com)]
- The programme holds quarterly face-2-face reviews (all are invited to attend)
- In addition, the programme has been holding a number of forums that meet on a more regular basis to discuss specific topics
- One forum covers Storage – we have held six meetings to date and the forum has 80 signed up members
- From this forum there have been a number of suggestions for new parameters that can be used to optimise the dispatch of Storage units
- Today we would like to take you through the discussions held to date

Current situation

The “15 minute rule”

- The ESO cannot be sure of the available energy from a storage unit
- To overcome this we use the “15 minute rule”
- The ESO will not issue an instruction beyond 15 minutes and uses the Maximum Import Limit (MIL) and Maximum Export Limit (MEL) to determine the amount of energy that can be safely dispatched
- After issuing an instruction the ESO waits for a redeclaration of MIL/MEL before issuing another instruction
- This advice is contained in the following document Stacking with BM (nationalgrideso.com)
- This rule has a number of shortcomings and so we have received a number of suggestions from industry to address these concerns

Options map for future changes

Control room operates on 3 time-frames:

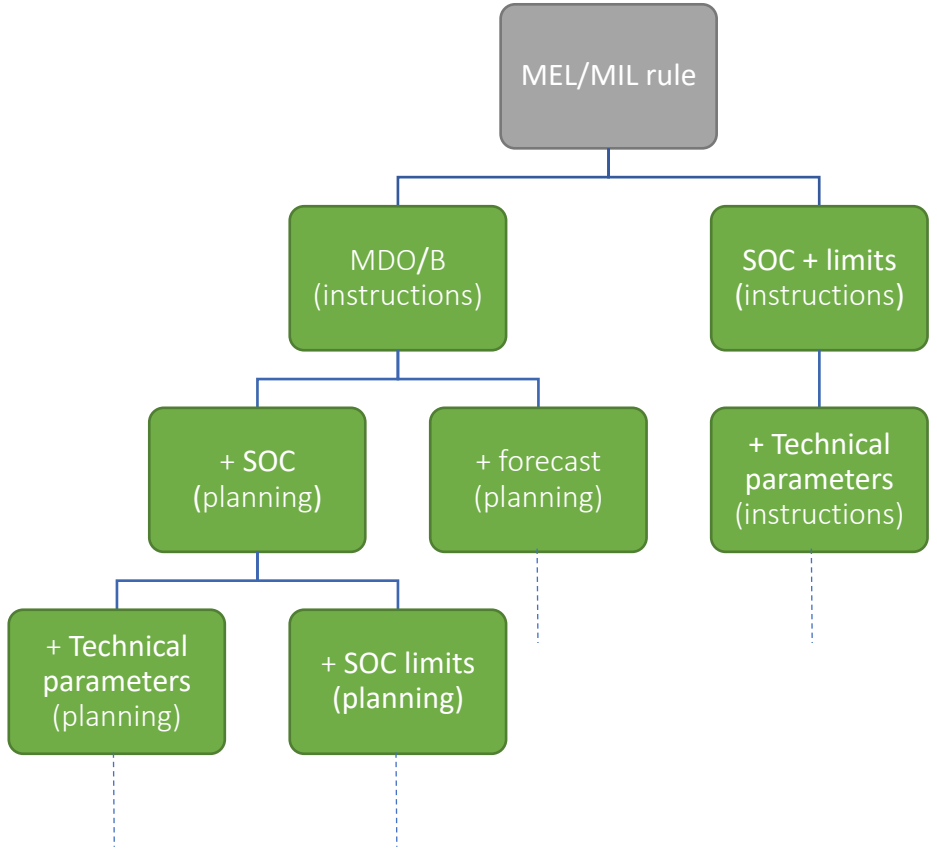
- system planning (48 to 4h ahead or real-time)
- dispatch (4h ahead)
- instructions (a few minutes ahead)

Parameters for instructions

- decoupling from MEL/MIL
- better estimates of asset capability
- more efficient operation

Parameters for system planning

- remove uncertainty in planning



MDO/B – (renamed from MDVE/I)

Maximum Delivery Offer / Bid

- amount of energy available for offers/bids
- time varying parameter?

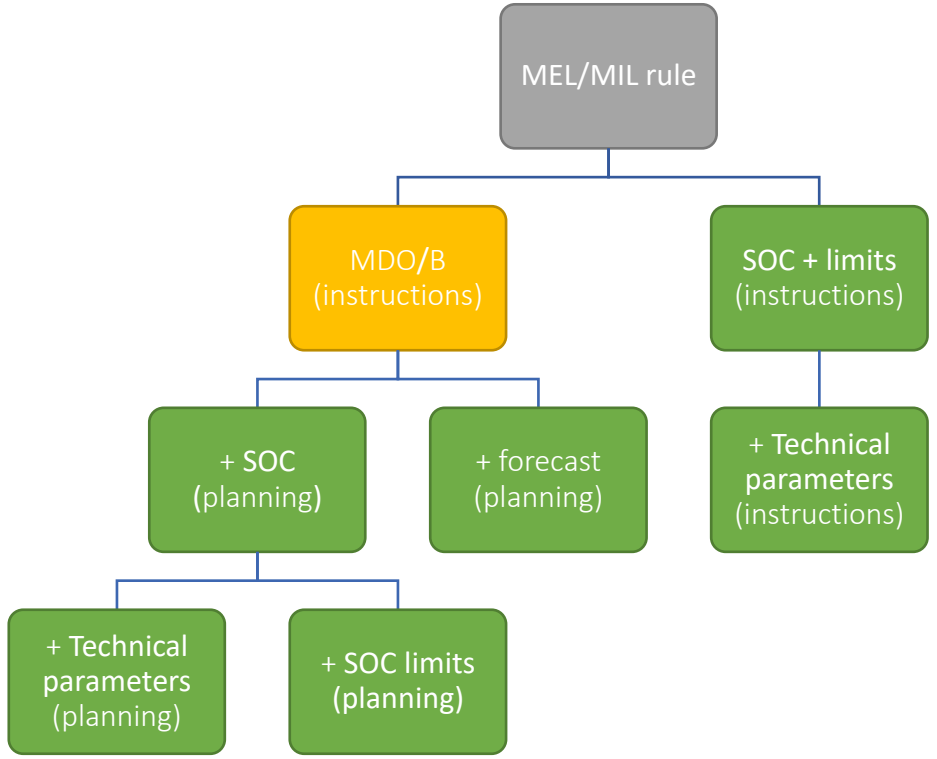
How it could work:

(1) Asset operator submits MDO/B (e.g. 5/5MWh for import/export from 19:22 to 20:15)

(2) ESO dispatches asset (e.g. 1MWh of export from 19:45 to 19:50)

(3) ESO keeps track of remainder of energy (e.g. 5/4MWh) up to 20:15

(4) Asset operator may update MDO/B to reflect change of SoC (e.g. 6.1/4 MWh from 19:50 to 20:15) or ESO could issue further instructions



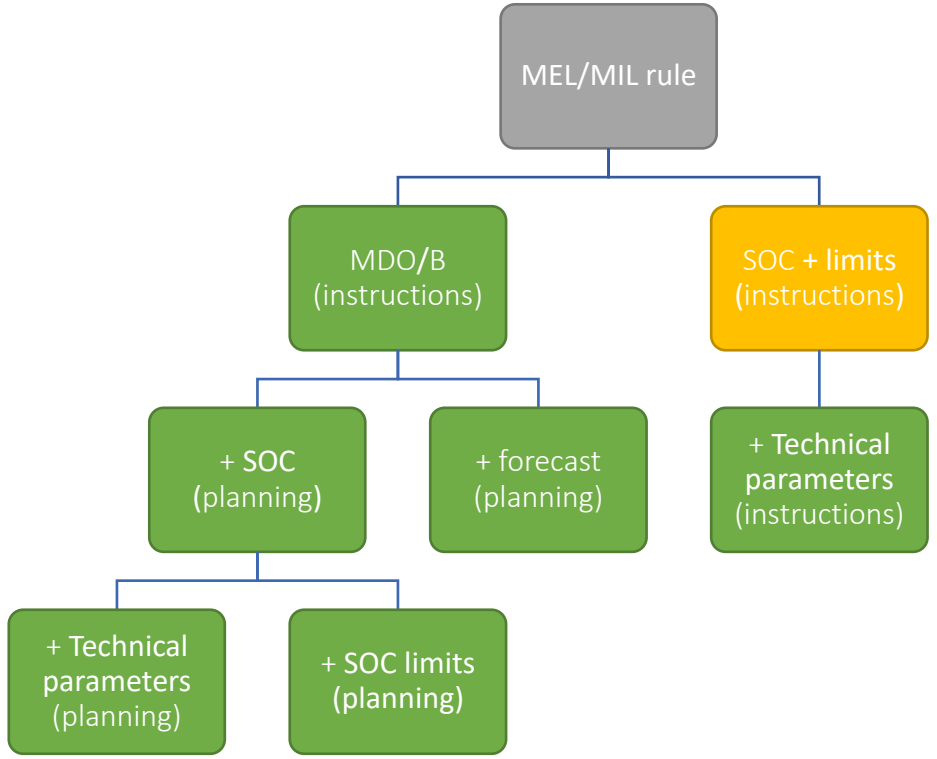
- This approach *decouples energy available from MEL/MIL*
- Allows provider to *indicate available energy for BOAs in the short-term*
- *May accommodate aggregations of storage / non-storage assets*
- *Frequency of data submission on asset charge/discharge dependent on design*

SOC + limits (for instructions)

SOC
- state-of-charge at a given point in time

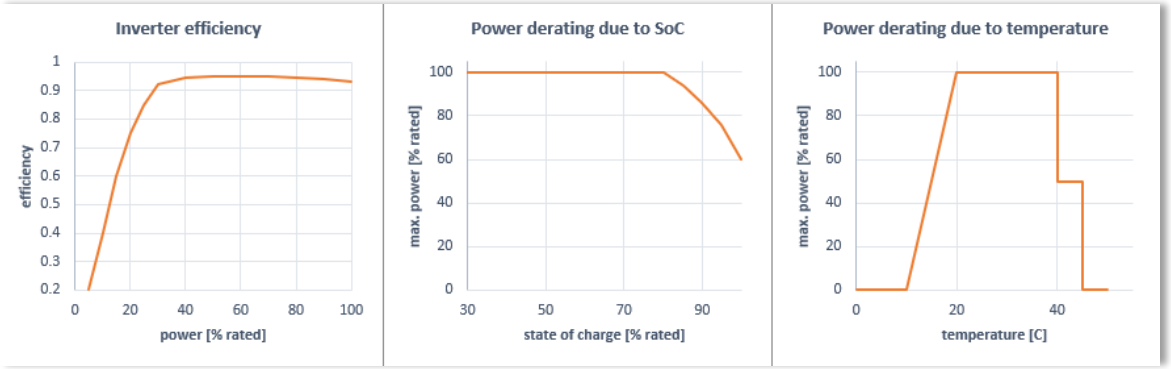
SOC limits
- bounds within which SoC should remain (similar definitions to MDO/B possible)

How it could work:
- ESO would have a *clear indication of asset capability*
- ESO could infer what is available for bids/offers based on SOC/SOC limits but *requires some assumptions about underlying model that describes a BMU*
- underlying models would have to be agreed with asset operators – *process could get complicated*
- *might not work for aggregated assets*

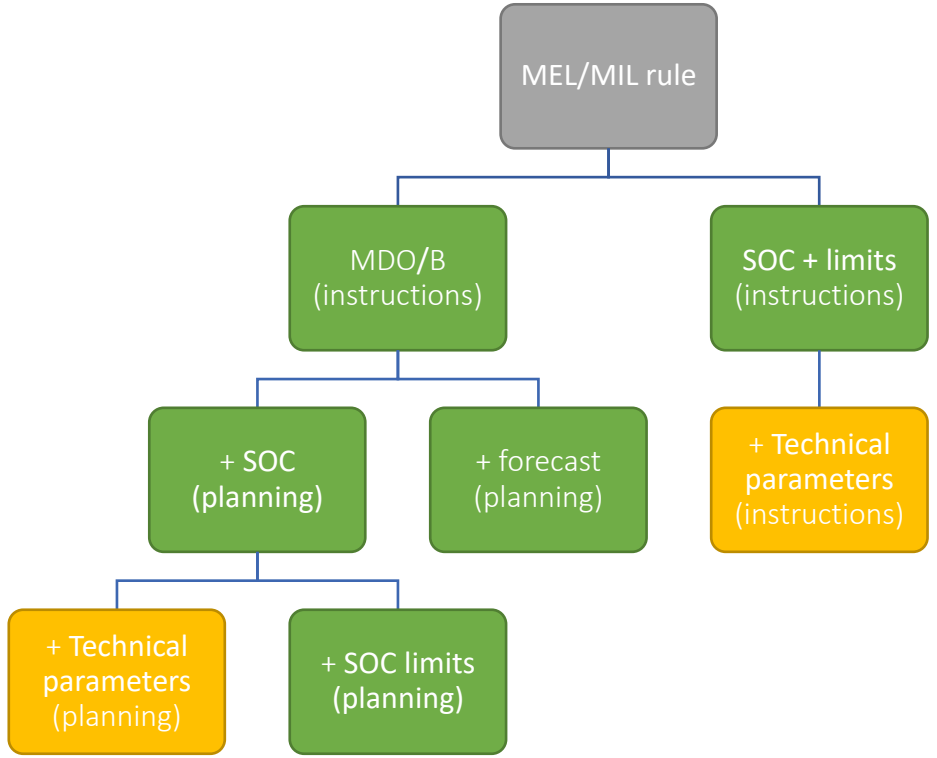


Provision of technical parameters

- Parameters may either be used for instructions (would affect BOA volumes) or for planning (rough estimates)
- Possible *confidentiality concerns* – would we need a process for updating outside BM?
- Underlying *models may still not be good enough* (e.g. battery storage has varying efficiency, may have power derated as function of SoC and temperature)

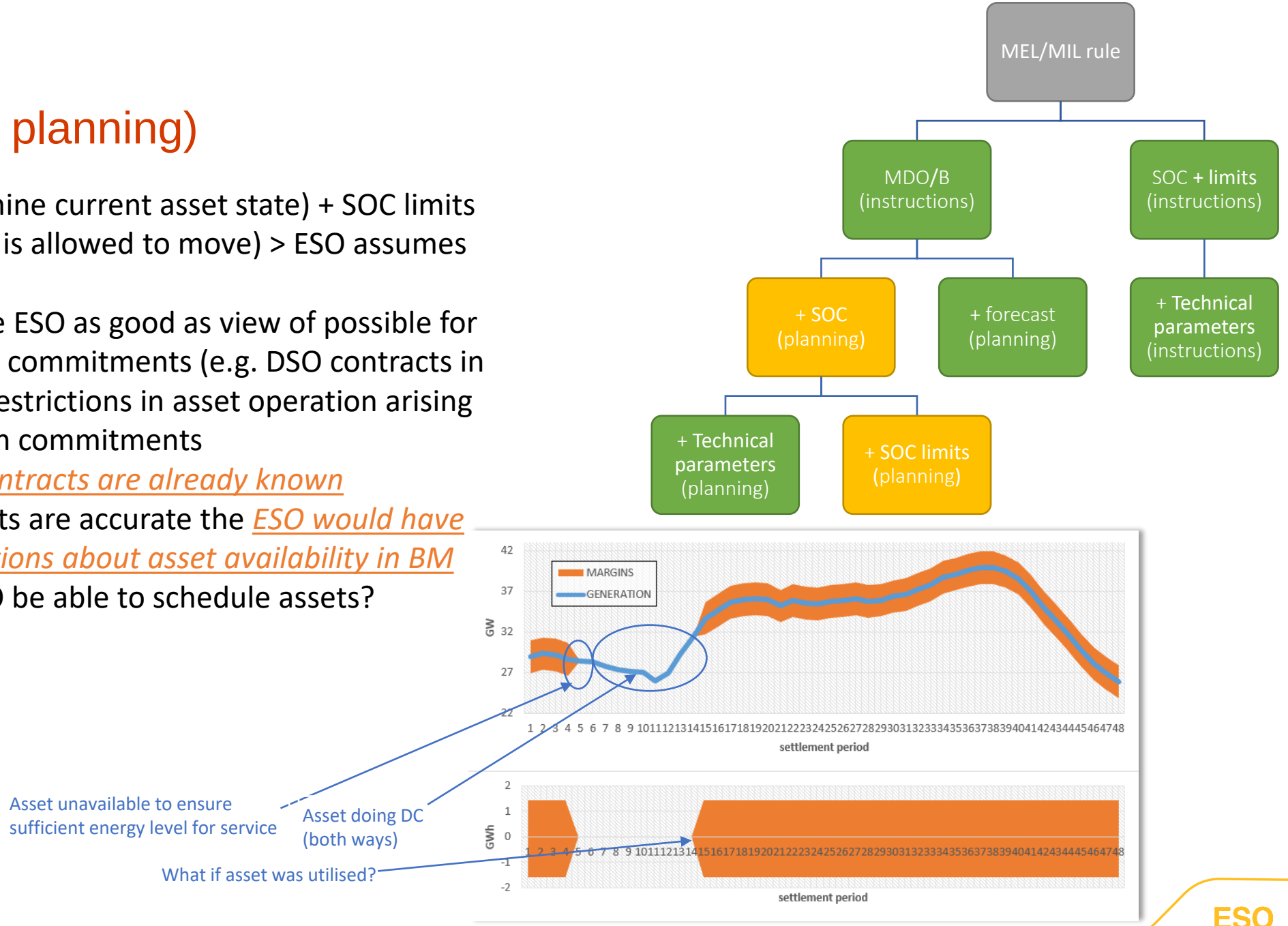


- Different parameters may be relevant for different assets and additional metering data (e.g. storage co-located with renewables or demand response) might be needed to use a model – *ESO handling such complexity might not be possible or appropriate*



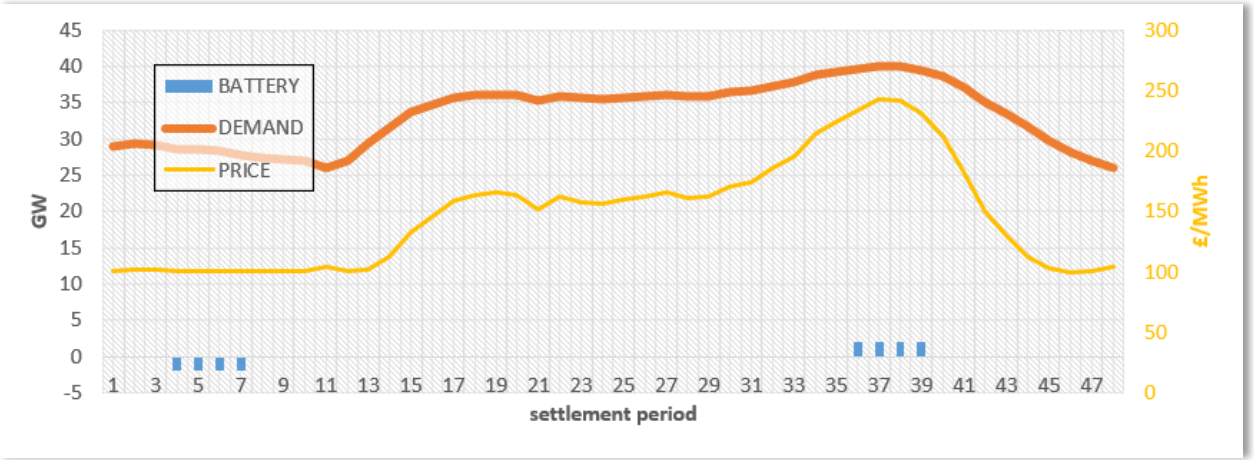
SOC + limits (for planning)

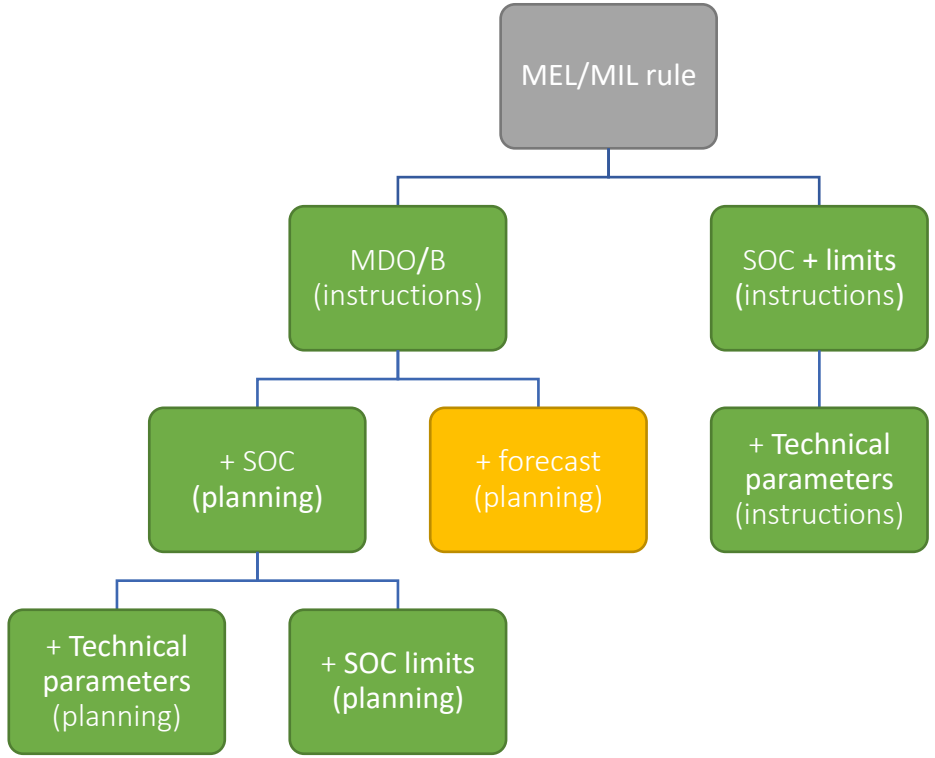
- SOC (to determine current asset state) + SOC limits (within the asset is allowed to move) > ESO assumes asset availability
- Should give the ESO as good as view of possible for asset contractual commitments (e.g. DSO contracts in the future) and restrictions in asset operation arising due to those such commitments
- *Current ESO contracts are already known*
- Even if the limits are accurate the *ESO would have to make assumptions about asset availability in BM*
- Should the ESO be able to schedule assets?



Asset operator forecasts

- In this case asset availability is set based on a best-view forecast from the asset-operator.
- It is reasonable to assume asset operators plan based on price forecasts and estimates on utilisation – *would the forecasts be usable?*



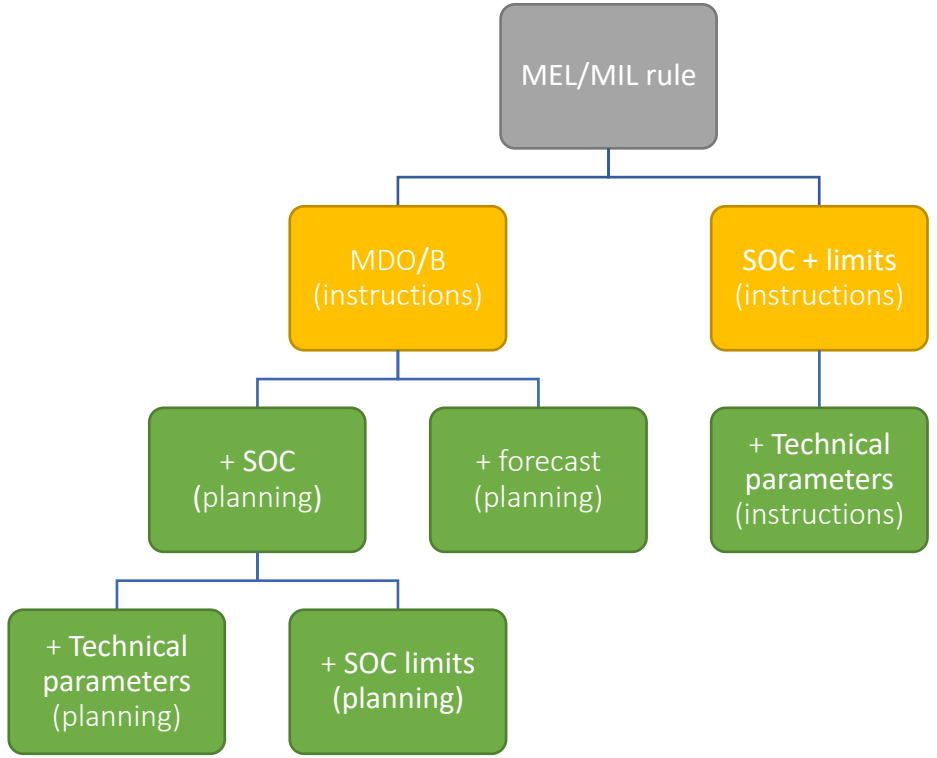


- Challenging to ensure a common derivation methodology (understand underlying assumptions) or check validity of data
- *ESO would still have to make assumptions about whether the asset is available in the BM*

Operational metering (non-EDL) approach

MDO/B or SOC-based data

- receive via SCADA
- data should be sufficient to indicate available energy for BOAs
- duration of time over which energy is available should also be defined (either assumed or via additional data)
- *no concerns over existing comms usage* (EDL)
- possible *concerns over quality of data*



Next Steps

- Take back and consider the feedback you have given today
- Replay this discussion to our Storage Stakeholder Forum
- Determine if we have enough information to start a Grid Code Change Process