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dimensions of a battery

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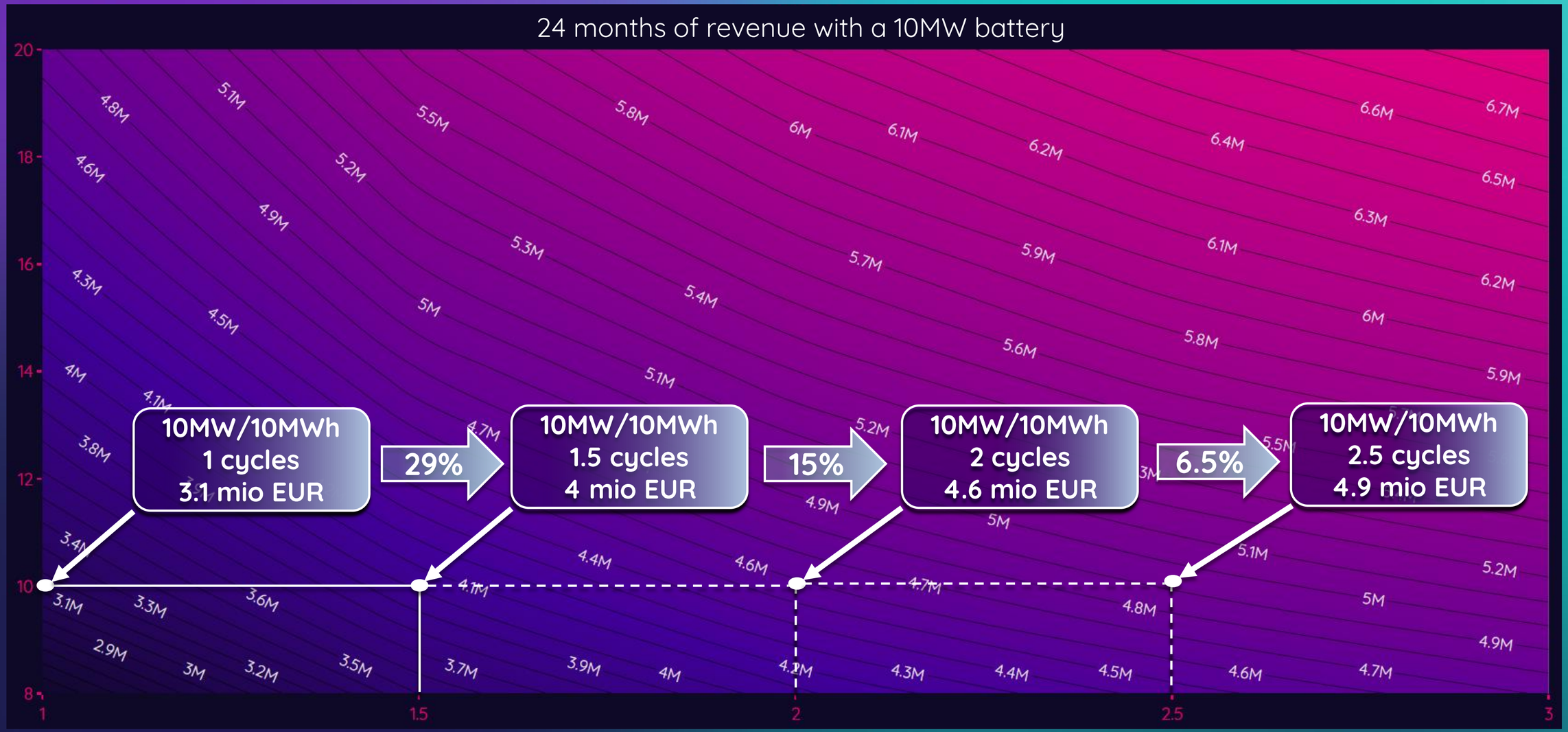
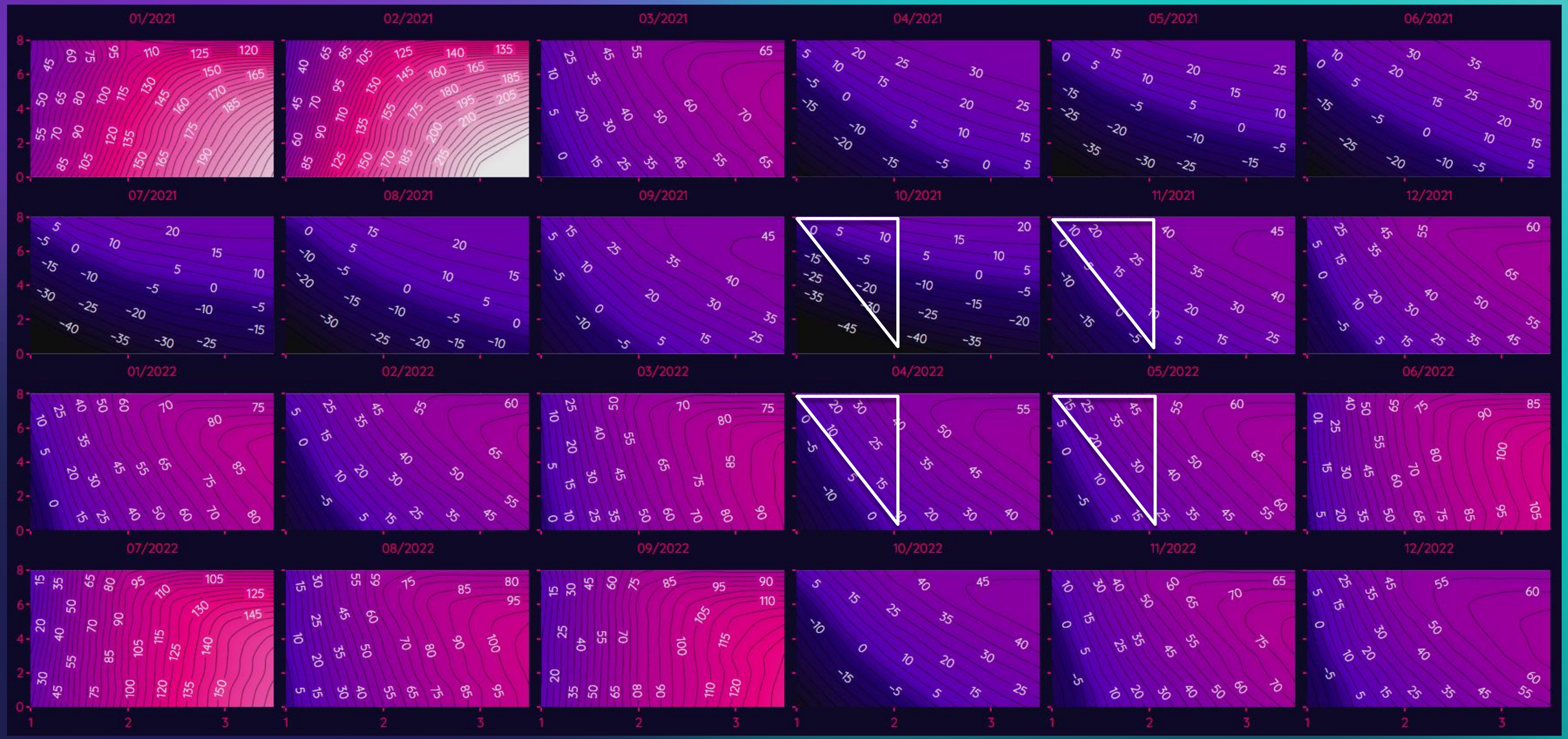
warranty terms: what to consider for cross-market optimization

battery sizing: impact of cycles, duration and degradation

warranty terms
impact of cycles on cross-market revenues



warranty terms
impact of cycles on cross-market revenues



warranty terms
impact of cycles on cross-market revenues

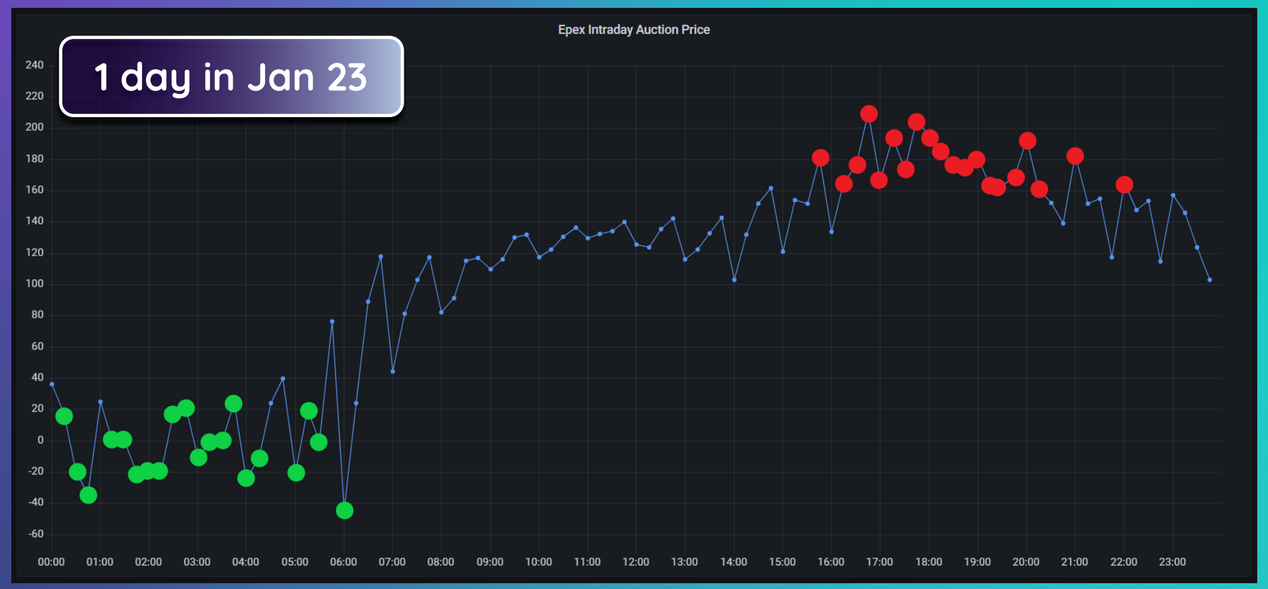
2 cycles are a good choice ->
more cycles, more options to combine
and stack revenue streams

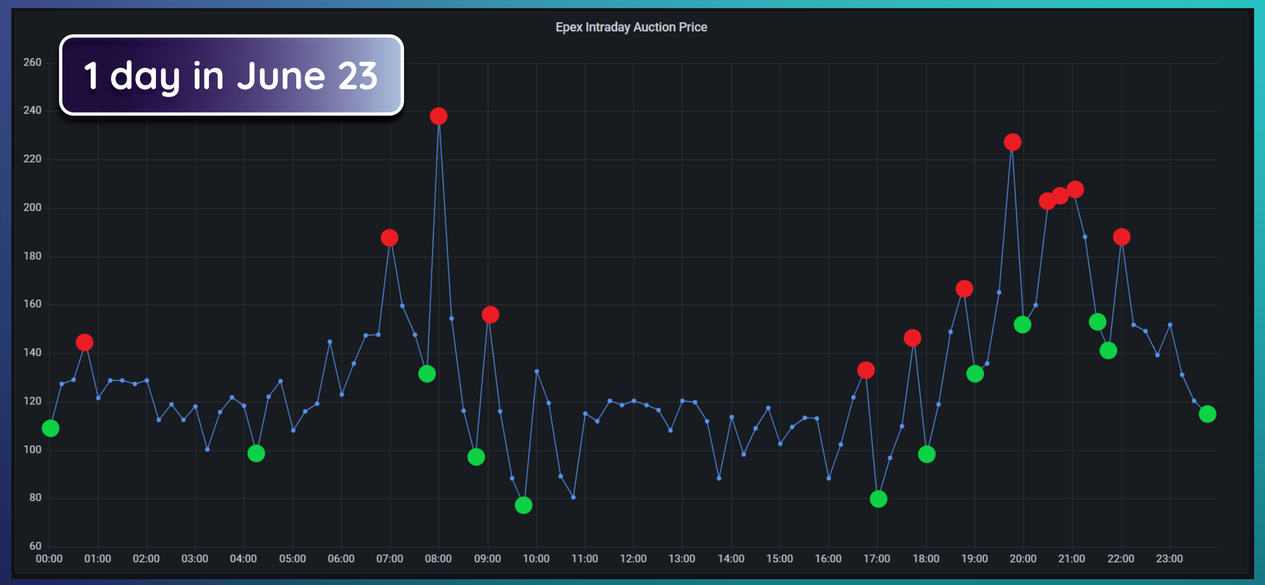
warranty terms
cycles => throughput and temperature

temperature: don´t let poor air conditioning limit your revenues

annual throughput: must match number of cycles and MWhs

what is more important
cycles or duration





duration

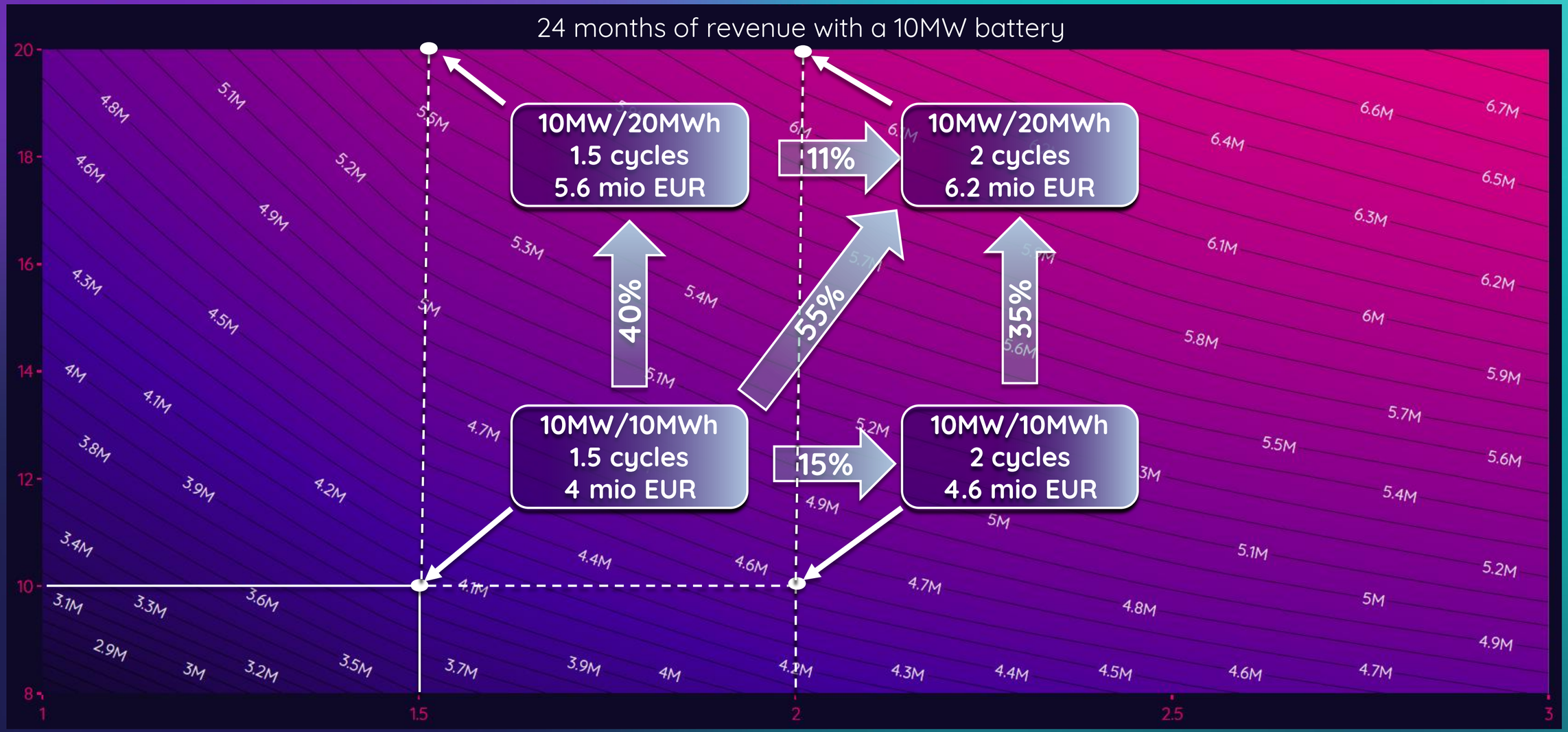
- no big deltas between quarter hours
  buying in the morning and selling in the evening
- only one cycle is needed but a long duration would be perfect: 20 quarter hours (5h) buying and 20 quarter hours selling

cycles

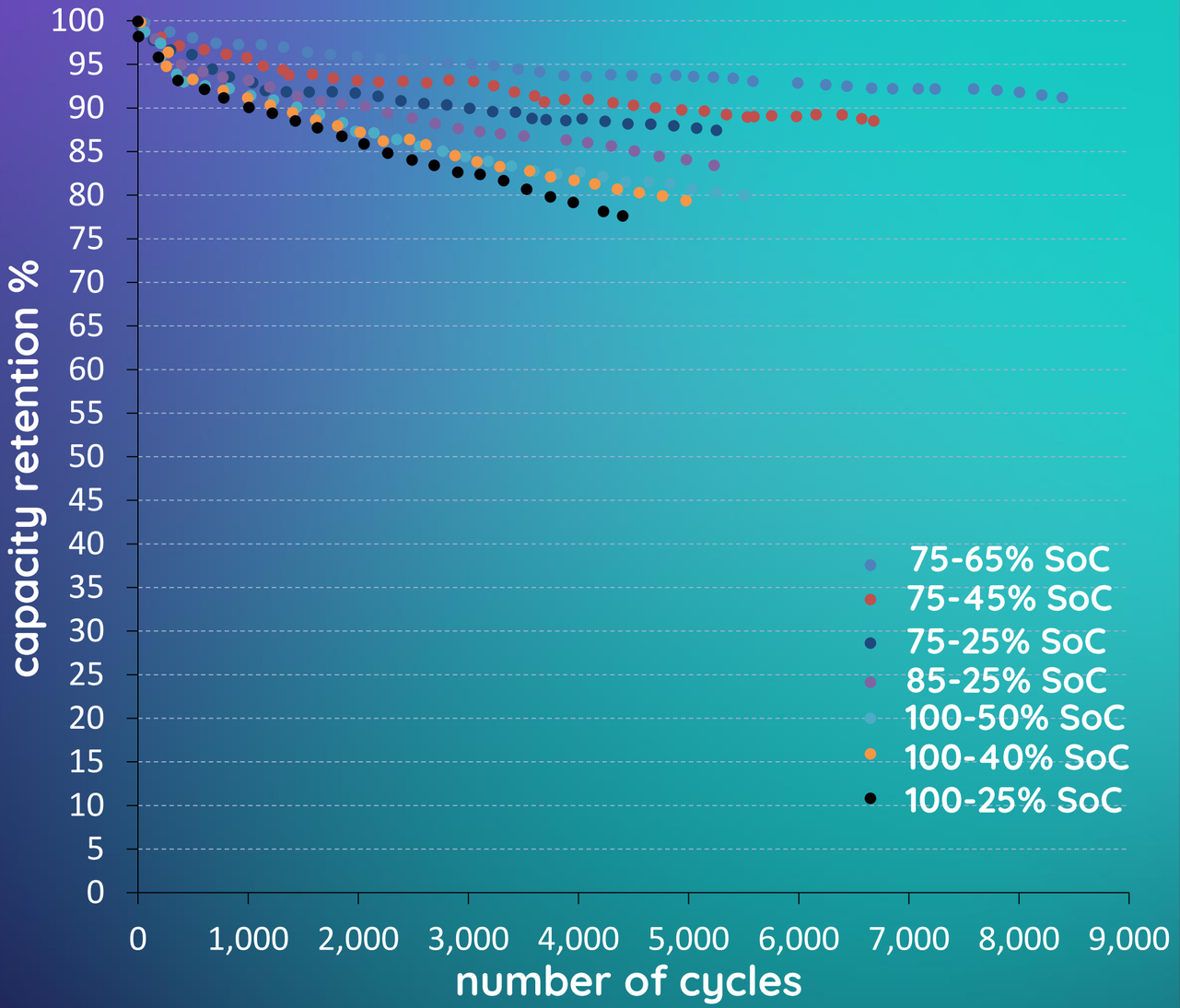
- in the morning and evening more than 4 quarter hours to charge and discharge -> 2 cycles +
- in this scenario cycles are important, but the duration is not that relevant

duration of batteries

1h, 1.5h or 2h - not an easy decision



degradation influence
of cross-market optimization



Source: Modeling of Lithium-Ion Battery Degradation for Cell Life Assessment; Bolun Xu, Student Member, IEEE, Alexandre Oudalov, Andreas Ulbig, Member, IEEE,G¨oran Andersson, Fellow, IEEE, Daniel S. Kirschen, Fellow, IEEE

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- longer duration gives you freedom to market the battery in a preferred SoC range
- finding the optimal SoC range to maximize revenues and keep batteries healthy
- trading strategies can be adapted to optimize the SoH and limit degradation

conclusion

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duration

- 2-hour batteries … give you more freedom regarding revenue streams
- … bring more freedom in the optimization strategies
- … keep your battery healthier and future-proof

degradation

- cross-market optimization keeps degradation low
- degradation can be considered in optimization strategies
- close cooperation also helps keep degradation low

warranty

- terms must be coherent in themselves
- cycles must be useable and throughput should not be a backdoor restriction
- don´t save in the wrong place (e.g. air conditioning)