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A bold future for Tidal Stream Power

To: BHA, All Energy 2010.

By: Marc Paish.

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Introduction

- 100kW grid connected demonstrator working today
- Power capture >40%
- 6 months in to an 8M€ FP7 project, to build the largest ever new concept Tidal Stream generator.

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PS 100

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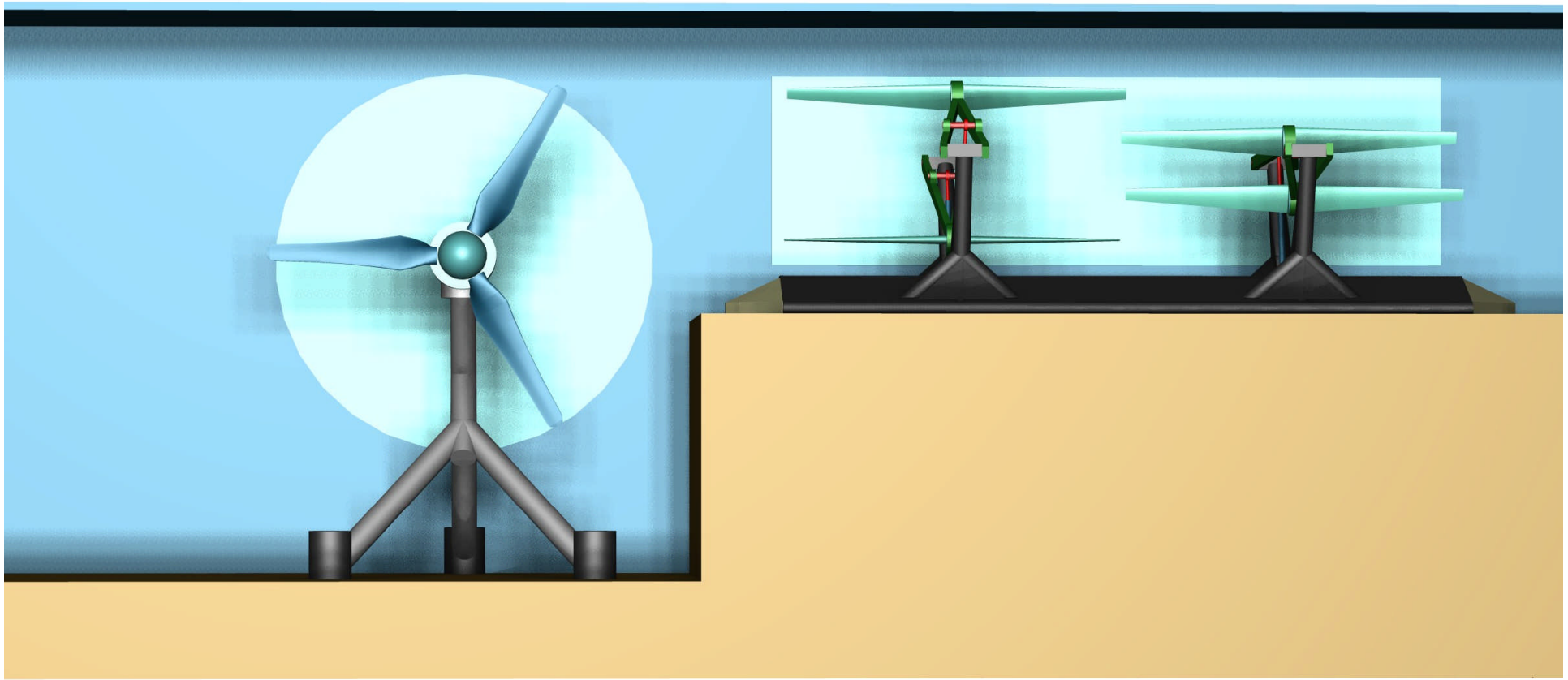
Concept



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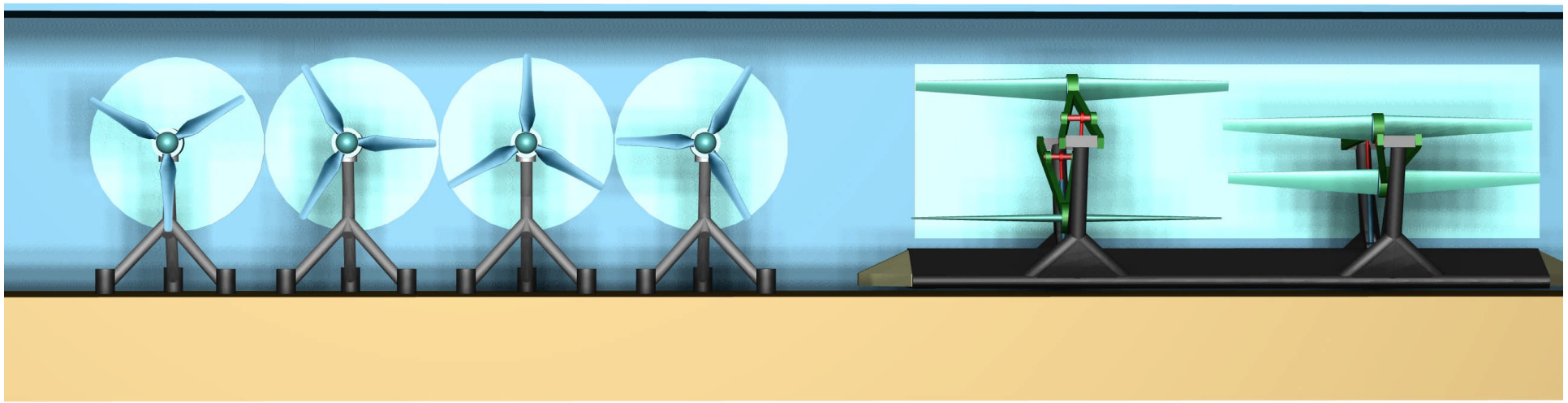
Concept



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Industry need for greater ambition

- Current accepted resource suggests a maximum installed capacity of 4GW
- Some interpretations of this figure suggest realistic installed capacity of 1GW
- Scattered, smallish arrays
- Is this a compelling vision?
- Why?
- Good engineering discipline. Cumulative conservative assumptions

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Can we do better?

- Mean tidal power entering UK waters (POL) is approx 250GW
- This means >1000GW at mean spring peak!
- Where is this energy going?
- Friction with sea bed. Proportional to flow speed cubed

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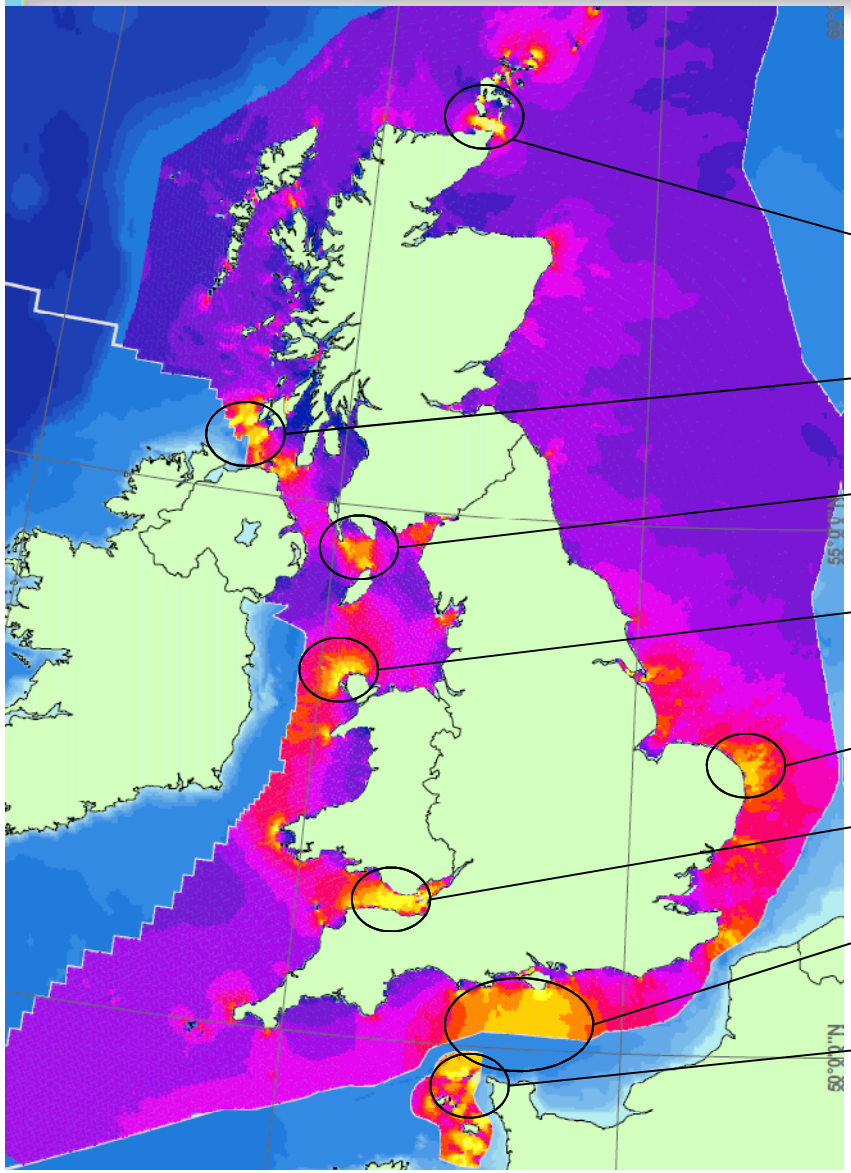
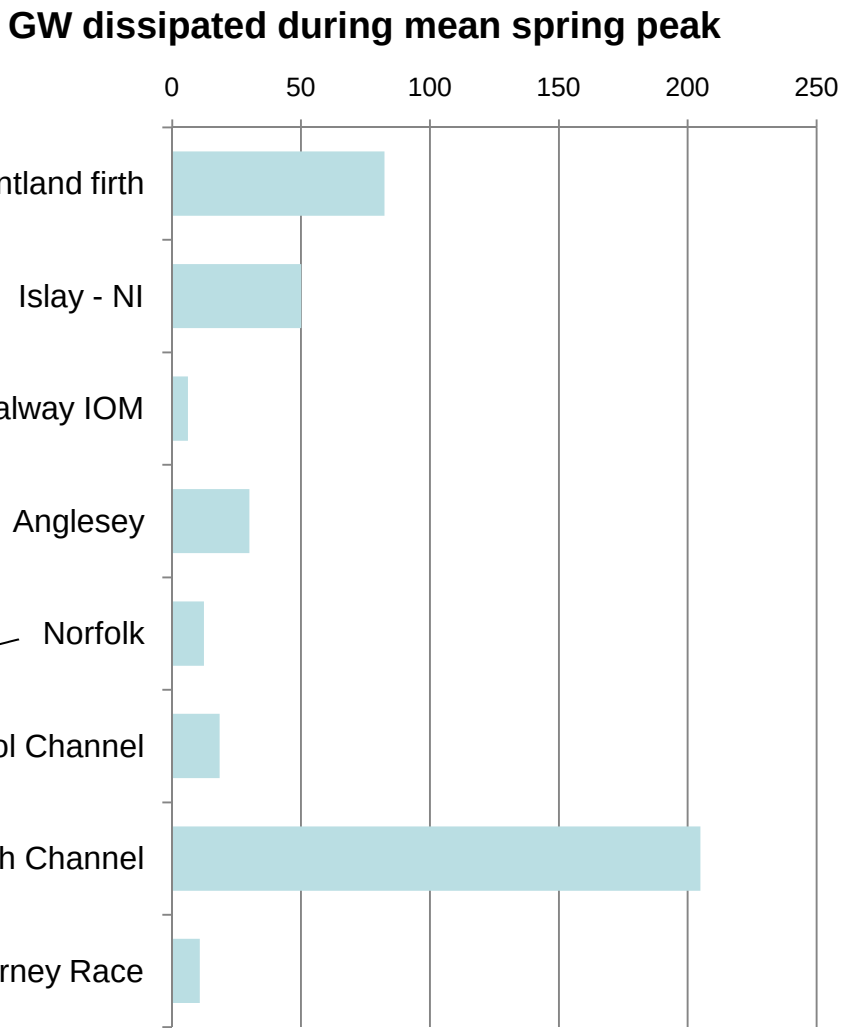
Where the power goes





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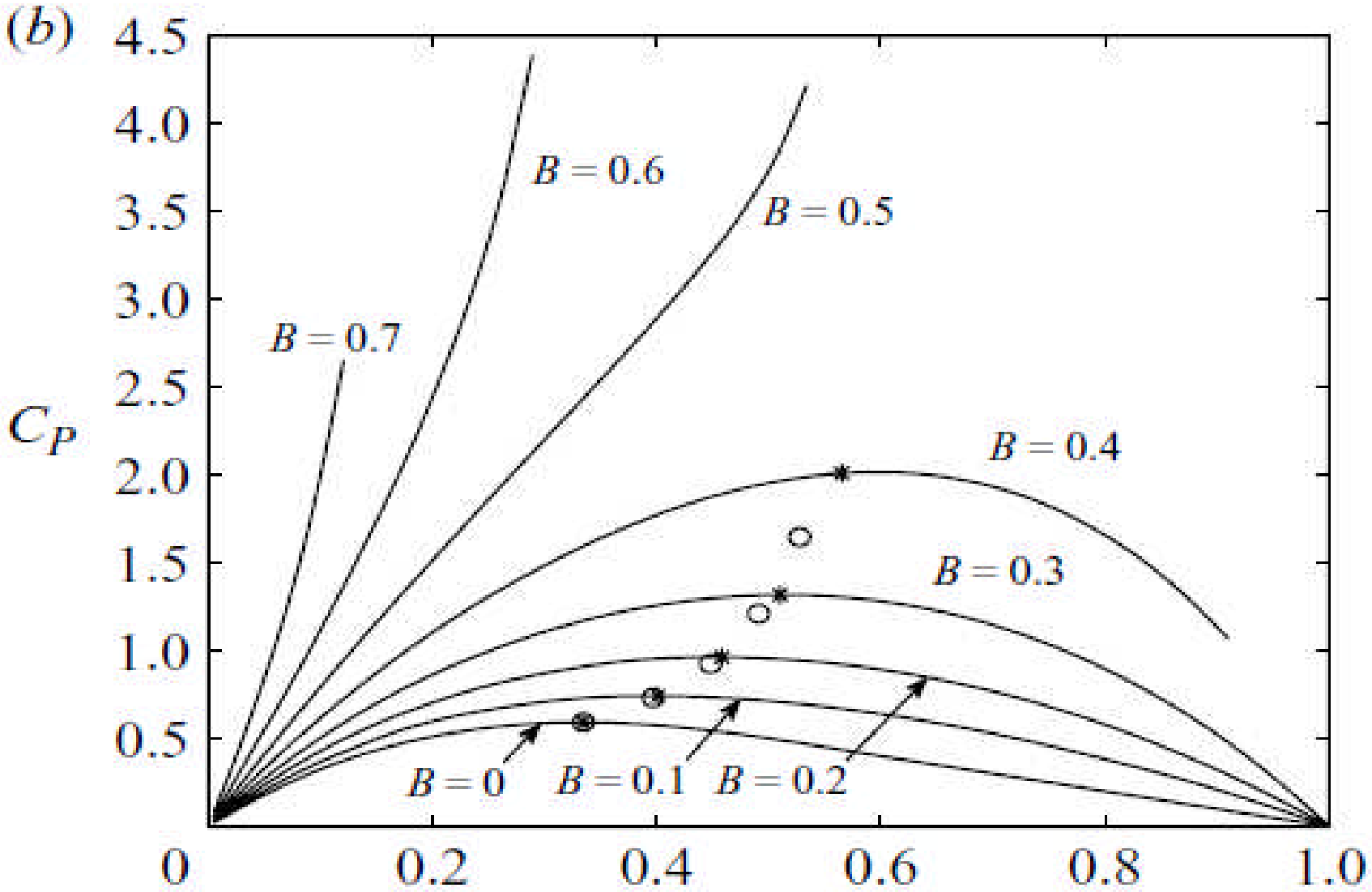
Yes but…



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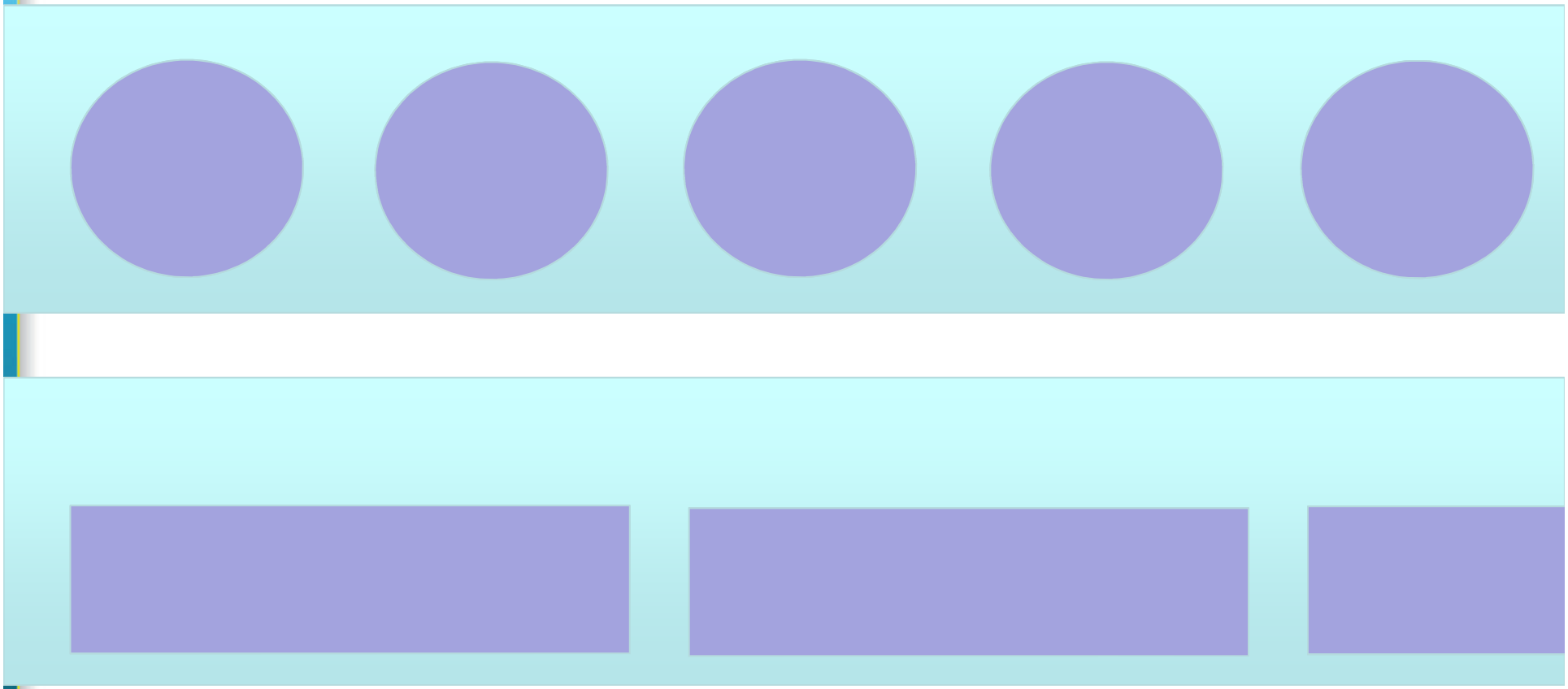
What does 40% blockage look like?



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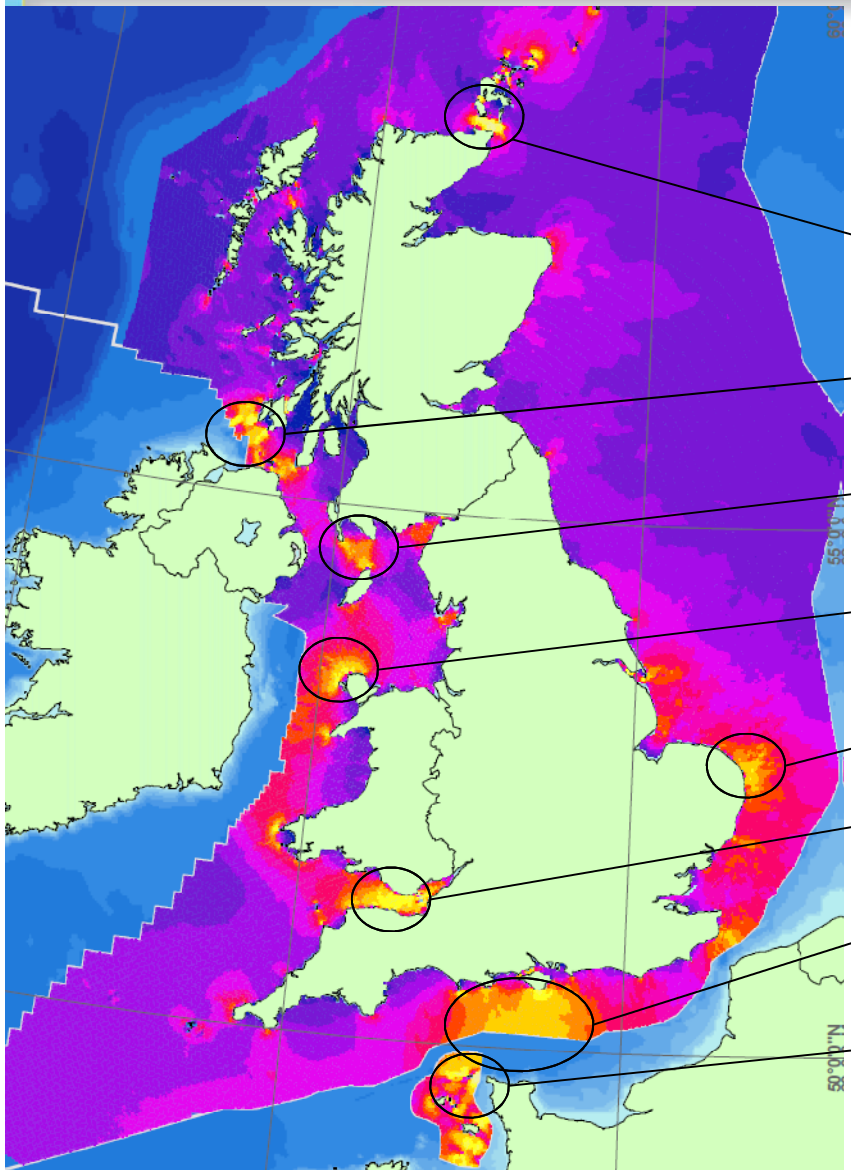
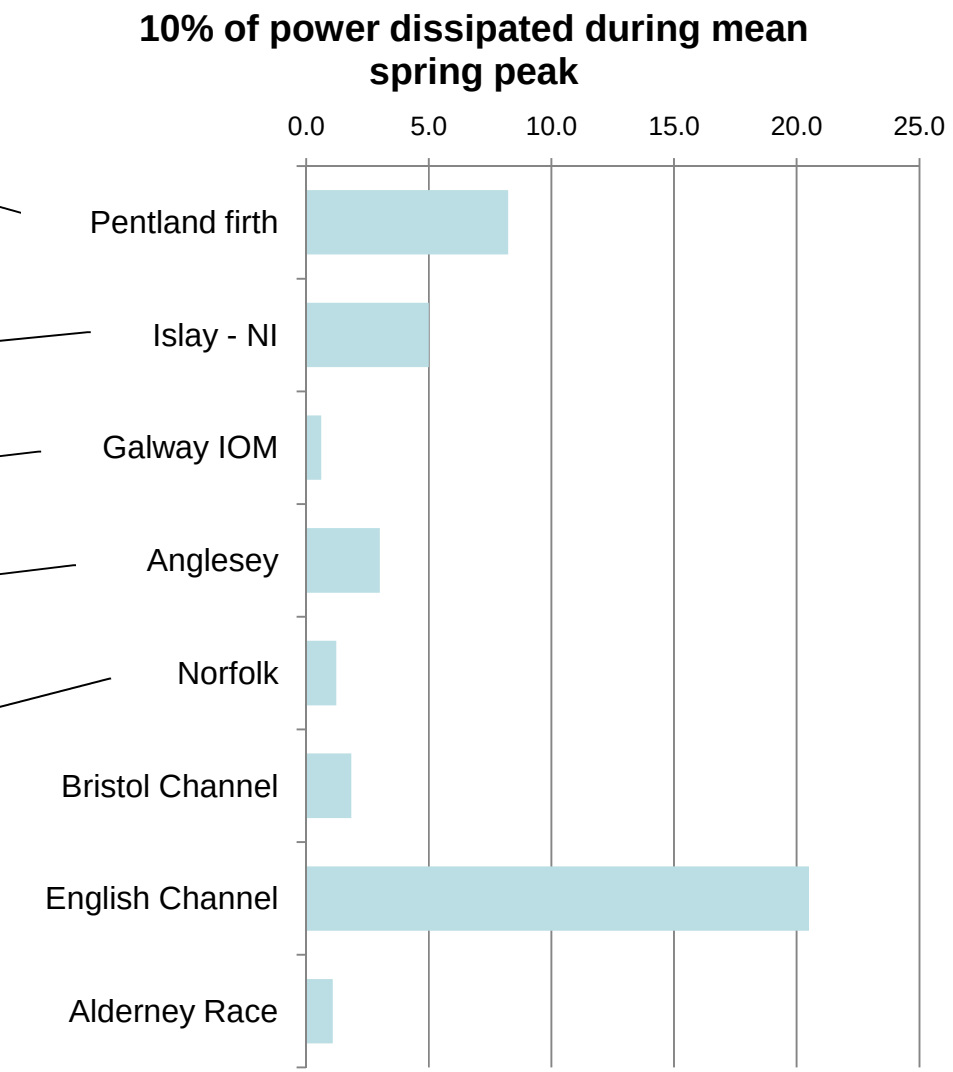
Where the power goes





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Conclusion

- Resource may have been underestimated
- Different methods suggest bigger resource
- Blockage effects show how much larger chunks of resource can be exploited
- GW scale arrays could exploit this and project the ambitious vision that Tidal Stream UK needs.
- More research now!