



# Hvussu verður føroysk elorka grøn í 2030? -sambært ph.d. verkætlan-

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# Innihald

- Innleiðing
- Útbyggingarættlan fram ímóti 2030
- Grøn orka og stabil elveiting
- Samanumtøka

# Innleiðing

Motivati3n og f3royska elskipanin

# Motivati3n

- Verkætlanin er grundað grønu visj3nina hjá SEV
- Umhv3rvisligir fyrimunir við burðardyggari orku
- At balansera orkuframleiðsluna er ein avbjóðing
- Truplari at tryggja stóðufesti við grønum orkukeldum

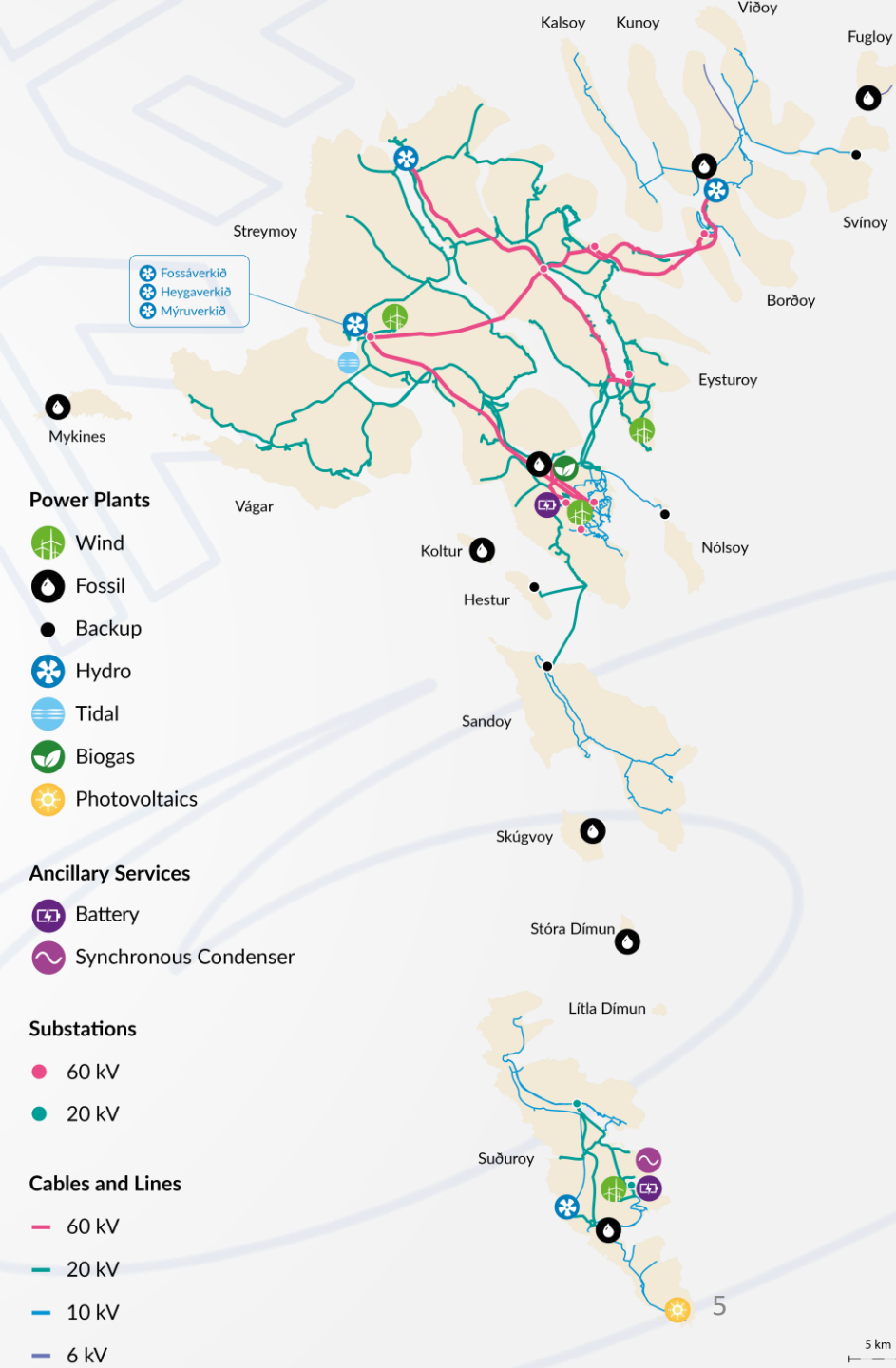
A circular logo with a dark blue background and a jagged, gear-like border. The text "100by 2030" is written in a bold, sans-serif font. "100by" is in a light green color, and "2030" is in a slightly darker green color.

100by  
2030



# Føroyska elskipanin

- 7 avbyrgd elnet í ymsum støddum
- Samlaða framleiðslan í 2021 var 424 GWt, harav 38% grøn
- Sløg av orku
  - Olja, vatn, vind, biogas, sól og sjóvarfall
- Goymslir
  - Vatnbyrgingar og battarískipanir

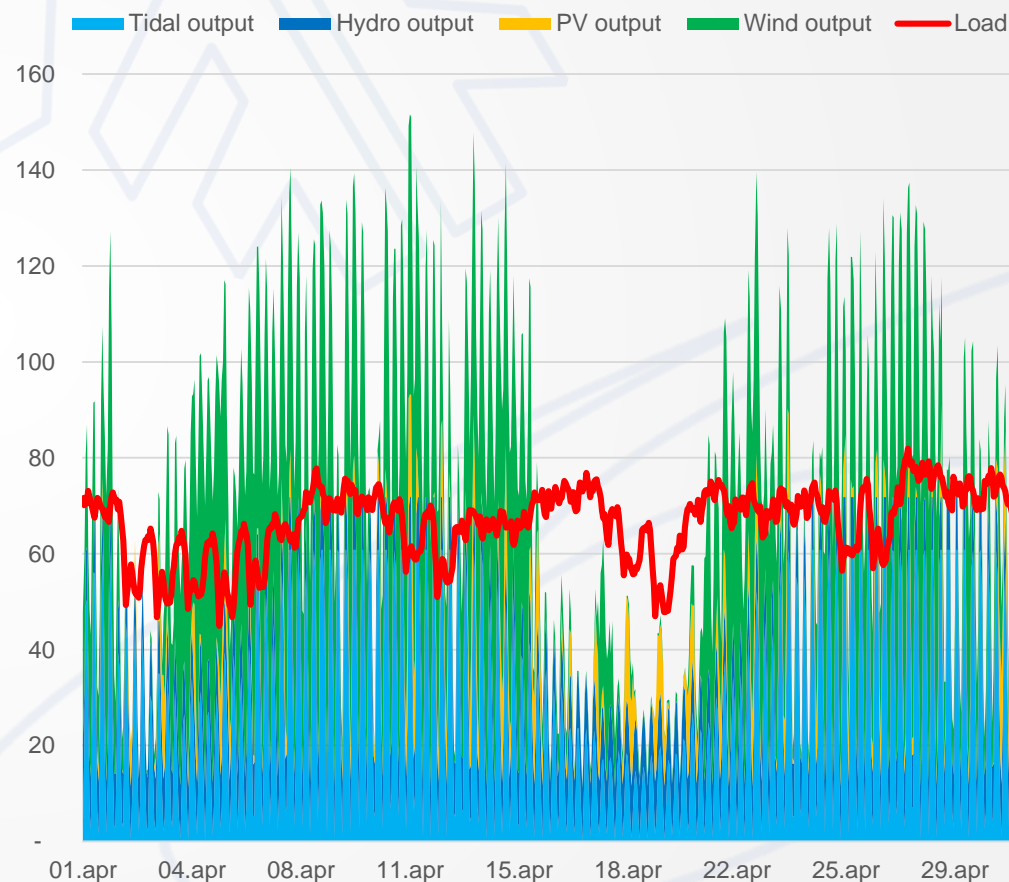


# Útbyggingarætlán

Hvør er best eignaða ætlanin?

# Orkubalansa

- At balansera orkuframleiðsluna er ein avbjóðing
  - Orkukeldurnar eru ekki 100% forsagnar
  - Náttúrlig tíðarbil utan orkutilfeingi
  - Skiftandi árstíðir
- Hvør er best egnaða útbyggingarætlanin?



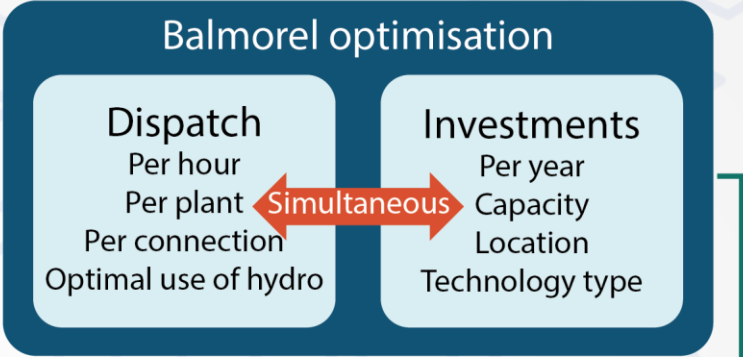
# Útbyggingarætlanir

- Elnetini í ávísimum oyggjasamfeløgum líkjast tí føroyska, t.d. Madeira. Tó er ongin ítøkilig mannagongd, ið vit brúka beinleiðis.
- Útbyggingarætlanir eru ofta bert grundaðar á búskaparligar optimeringar, men hesar eftirbyggjast.
- Hædd má verða tikin fyri praktiskum viðurskiftum fyri at hava eina ítøkiliga útbyggingarætlan
- Ein ítøkilig útbyggingarætlan er neyðug um man skal røkka málinum

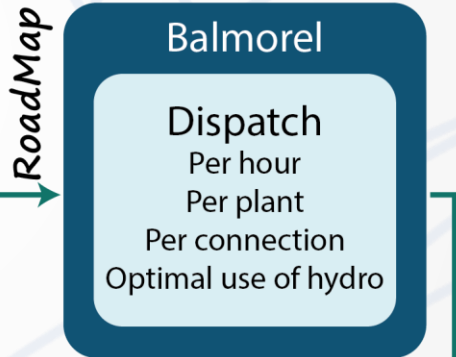
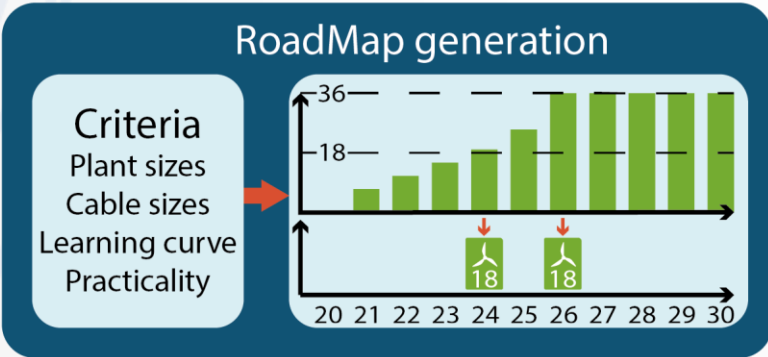
**Policy constraints**  
*CO<sub>2</sub> restrictions & maximum instantaneous inverter-based generation*

**System model**  
*existing capacities, committed capacities, demand, costs & emissions*

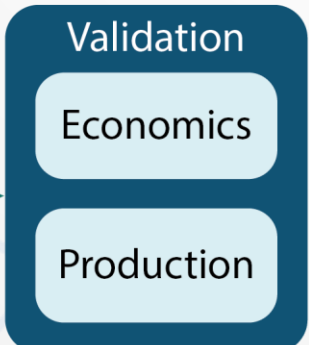
**Investment options**  
*suitable sites, local resource potential, maximum capacities per site & costs*



*Optimal investments*



*Economics and production*



### Policy constraints

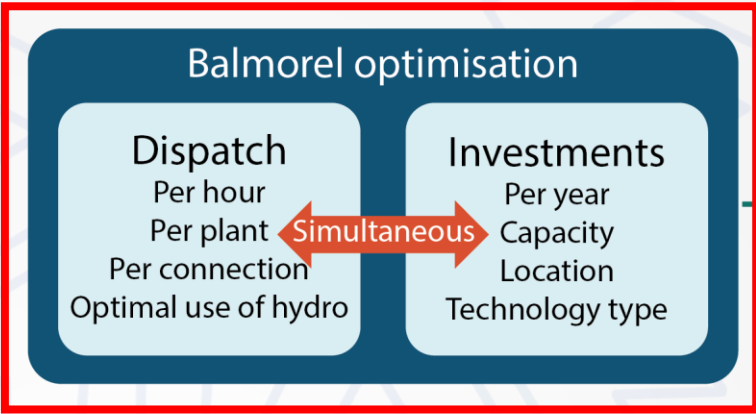
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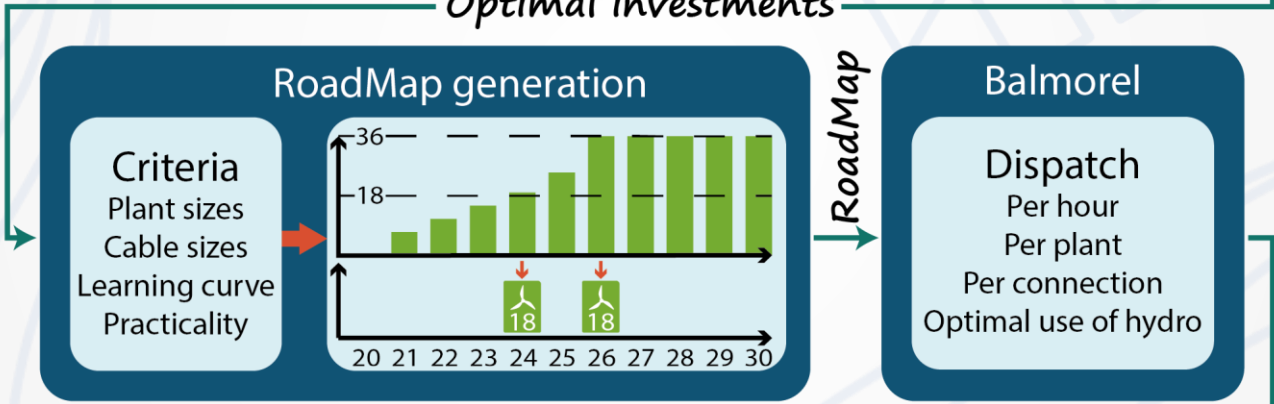
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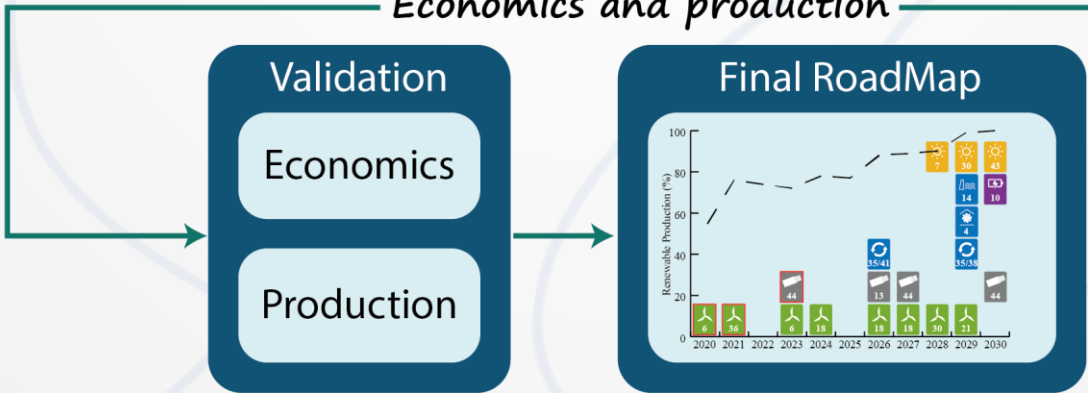
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### Optimal investments



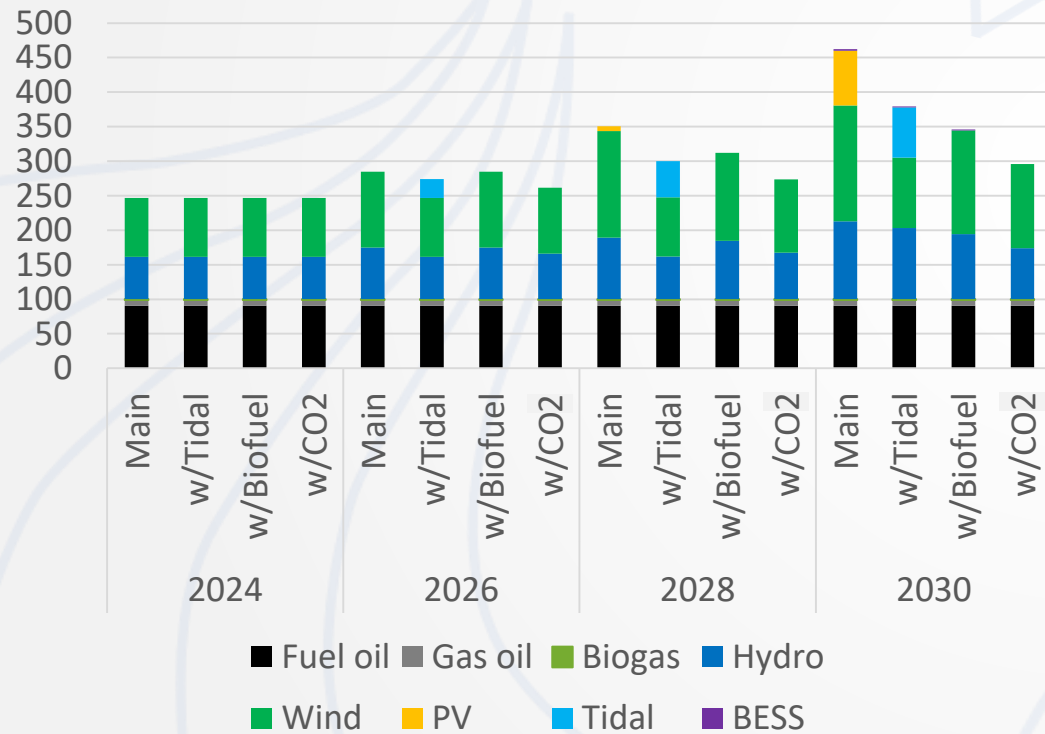
### Economics and production



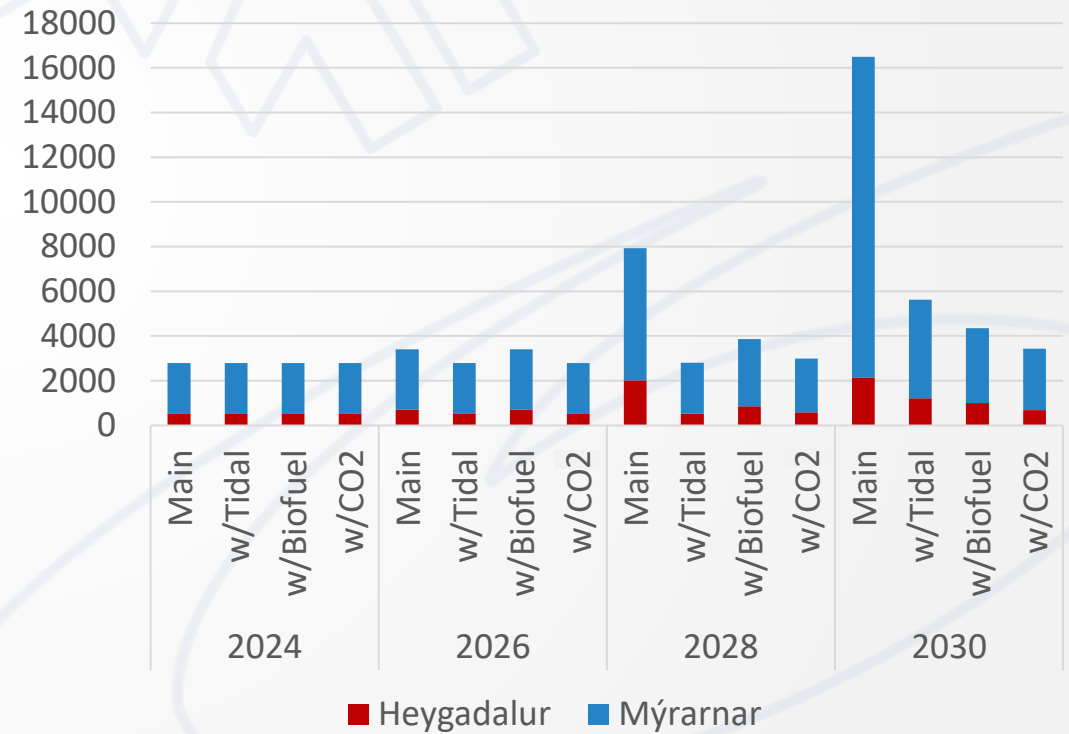


# Úrslit frá optimeringini

## Framleiðslumáttur (MW)

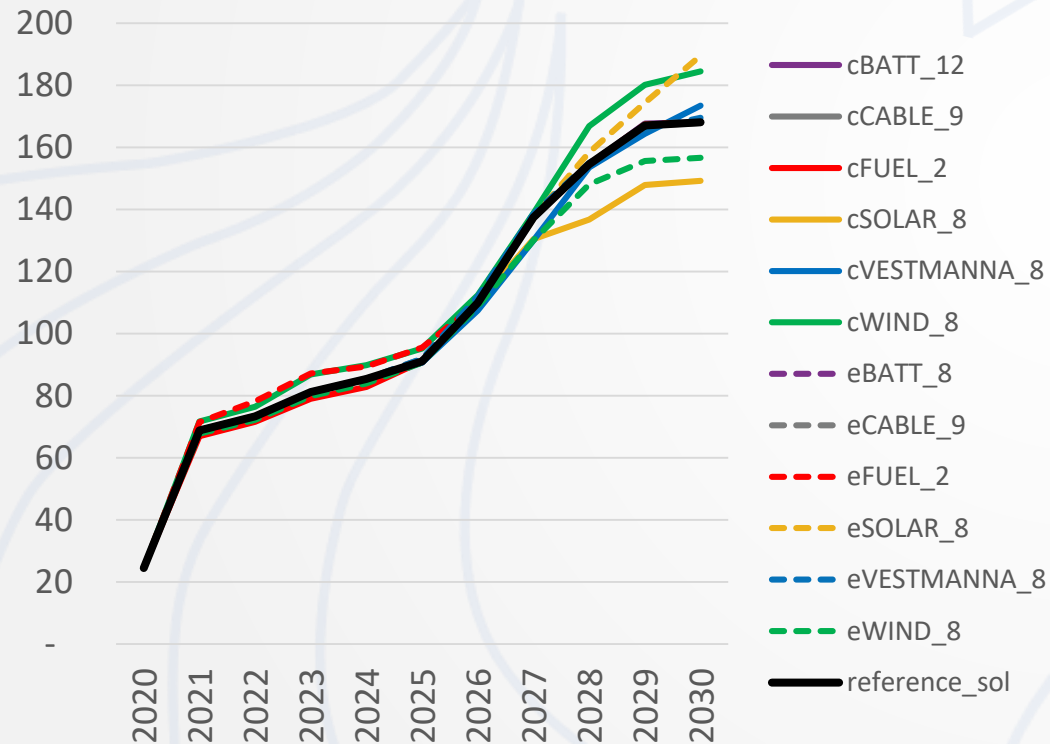


## Vatngoymsla (MWt)



# Úrslit frá optimeringini

## Sensitivitetur á vindmátti (MW)



## Samantitkið

- Burðardygg orka er búskaparliga besta valið upp til 86-87%
- Stigið frá 96% í 2028 til 100% í 2030 tvífaldaðar tærvin á goymslu
- Sjóvarfalsorka kann kollvelta útbyggingarætlini, tí at hon minskar framleiðslumáttin við 18% og goymslutærvin við 75%
- +/- 20% íløgu- og brennievniskostnaður ikki hefur stóra ávirkan á útbyggingina



### Policy constraints

CO<sub>2</sub> restrictions & maximum instantaneous inverter-based generation

### System model

existing capacities, committed capacities, demand, costs & emissions

### Investment options

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### Balmore optimisation

#### Dispatch

Per hour  
Per plant  
Per connection  
Optimal use of hydro

Simultaneous

#### Investments

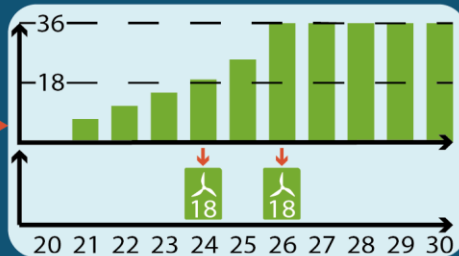
Per year  
Capacity  
Location  
Technology type

### Optimal investments

### RoadMap generation

#### Criteria

Plant sizes  
Cable sizes  
Learning curve  
Practicality



RoadMap

### Balmore

#### Dispatch

Per hour  
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### Economics and production

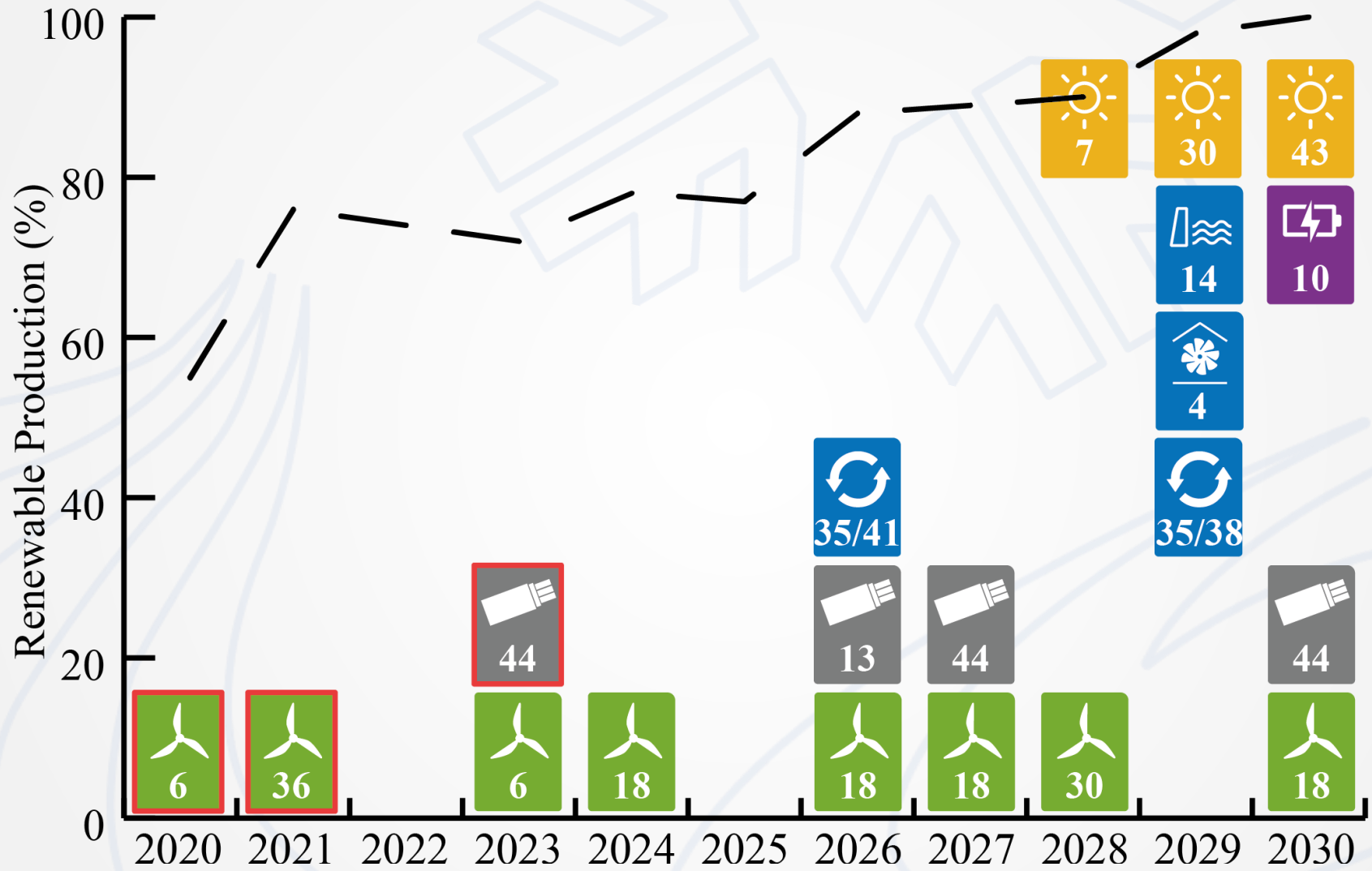
#### Validation

Economics

Production

### Final RoadMap





### Policy constraints

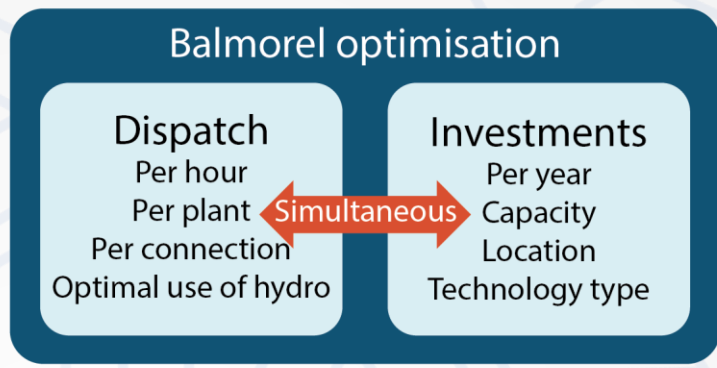
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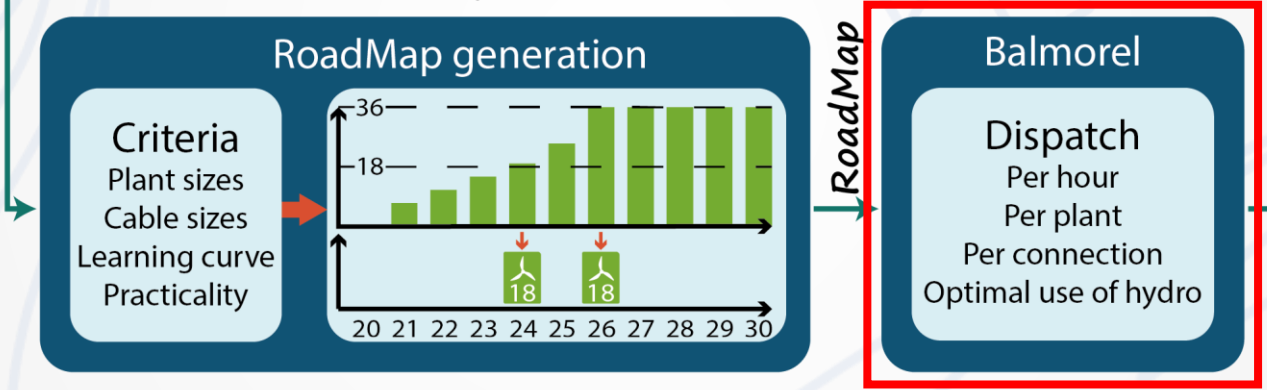
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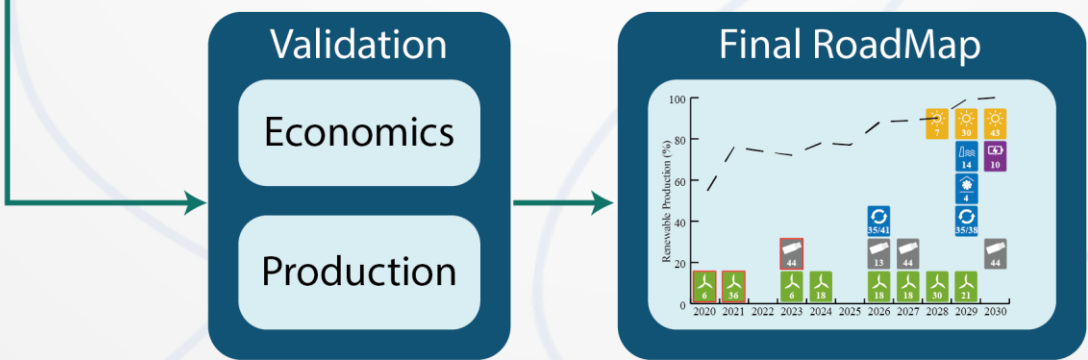
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### Optimal investments



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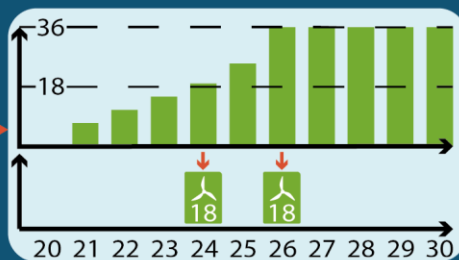
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RoadMap

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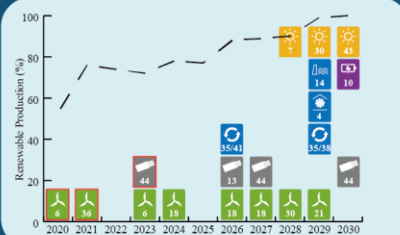
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#### Validation

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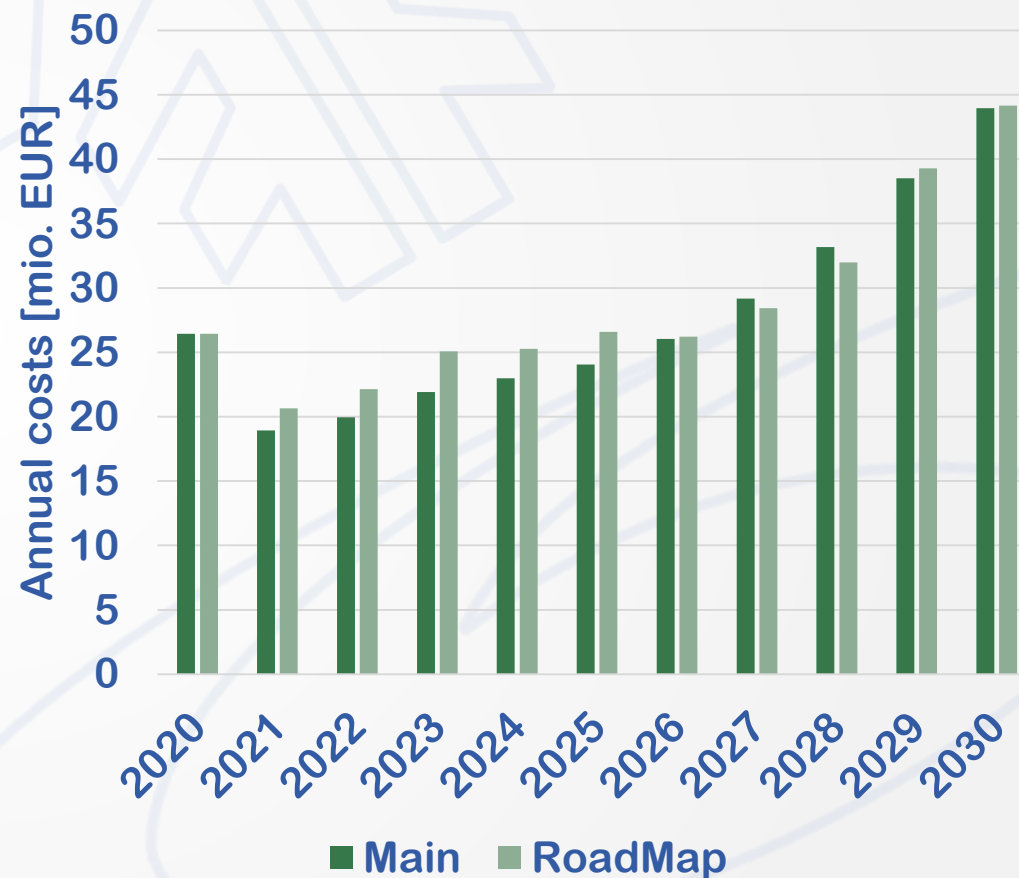
Production

### Final RoadMap



# Validering av útbyggingarætlan

- Framleiðslan er optimera í Balmorel, útbyggingin er føstløgð
- Framleiðslan í 2030 skal verða 100% burðardygg
- Búskaparliga skal útbyggingarætlanin líkjast tí optimalu loysnini



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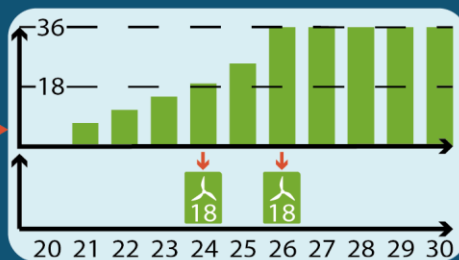
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RoadMap

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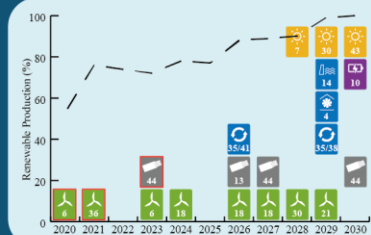
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Economics

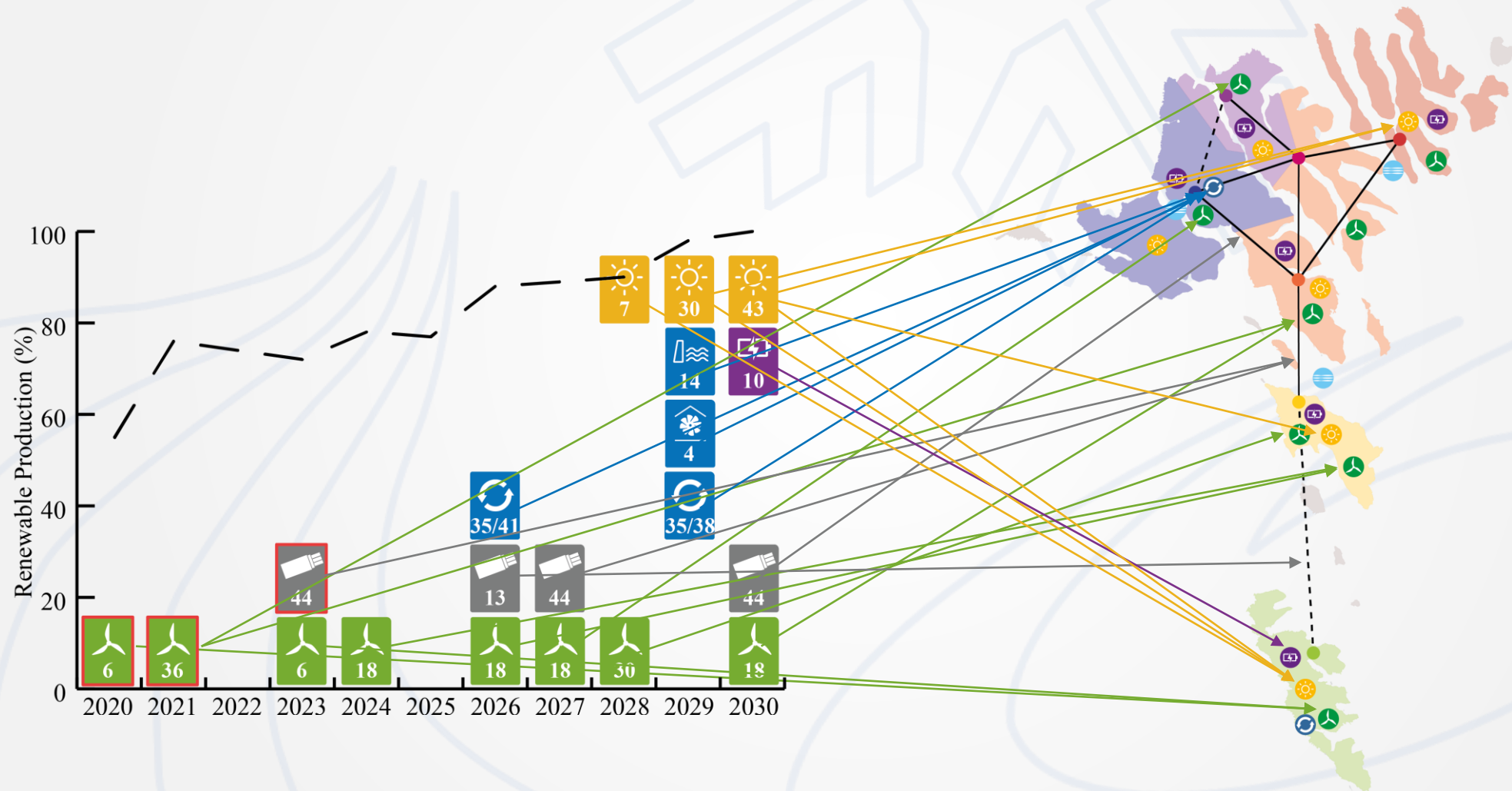
Production

### Final RoadMap





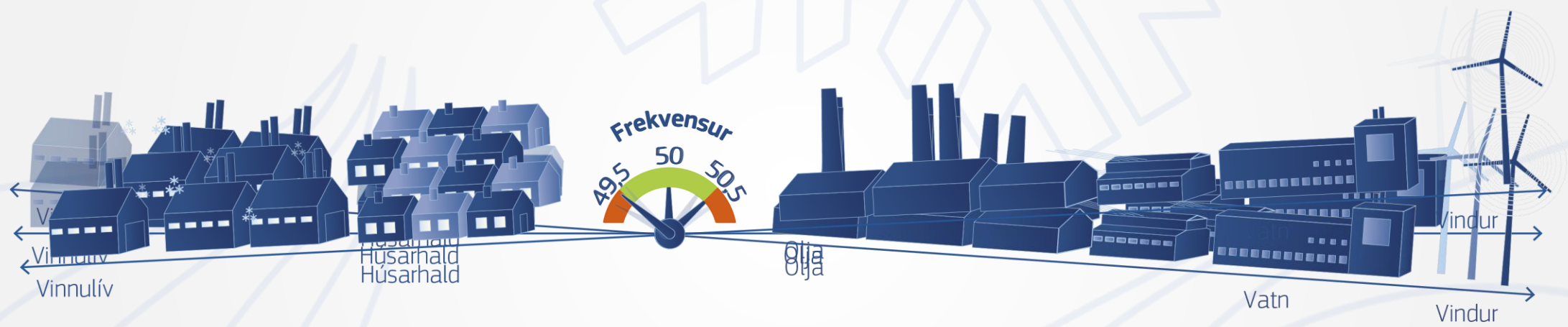
# Útbyggingarætlánin



# Stöðufesti

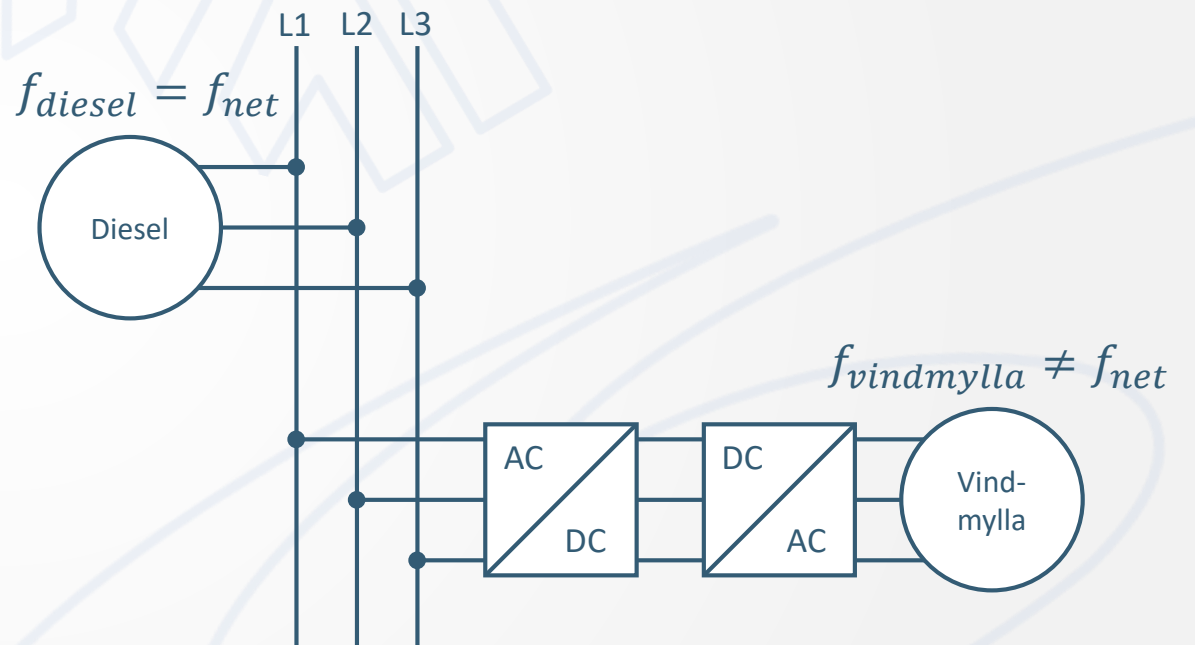
Hvussu tryggja vit stöðufesti?





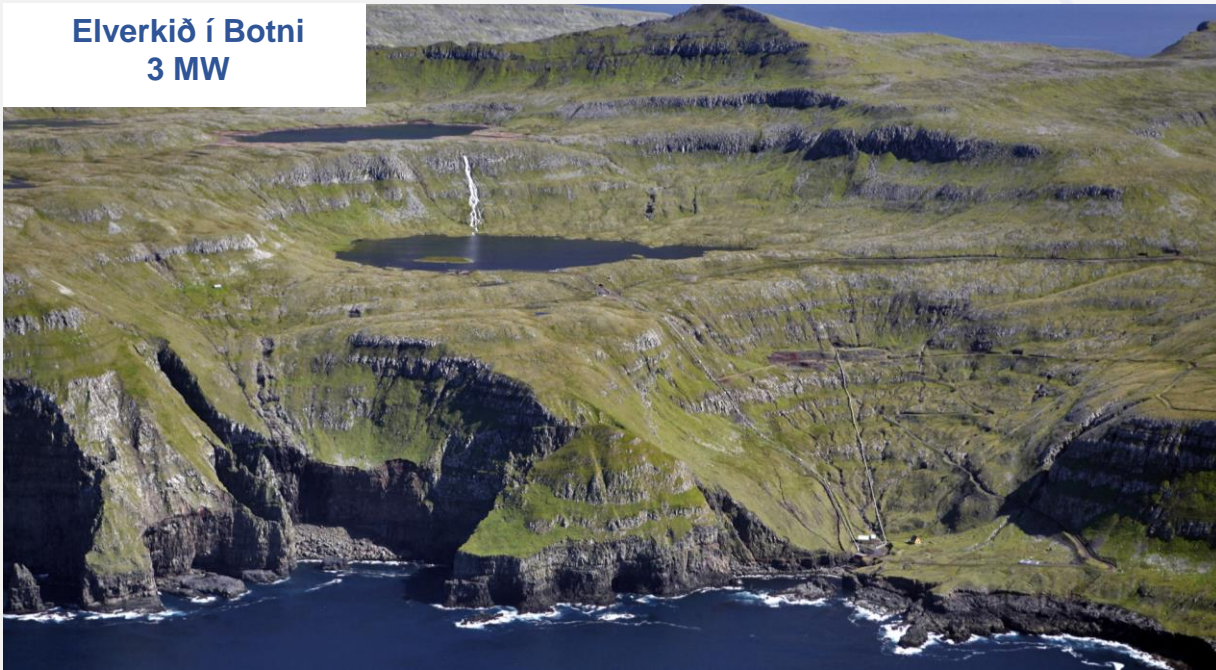
# Stöðufesti á elnetinum

- Olju- og vatnverkini tryggja stöðufesti á elnetinum í dag
- Øðrvísi elframleiðsla
  - Avmarkaðar og veðurstýrðar orkukeldur
  - Óstöðugar orkukeldur
  - Avbyrgt elnet
  - Inverter-basera framleiðsla
- Hvussu tryggja vit stöðufesti?





**Elverkið í Botni  
3 MW**



**Porkerishaginn  
6,3 MW**



**Vágsverkið  
14 MW**



**Sólpanelini í Sumba  
0,3 MW**

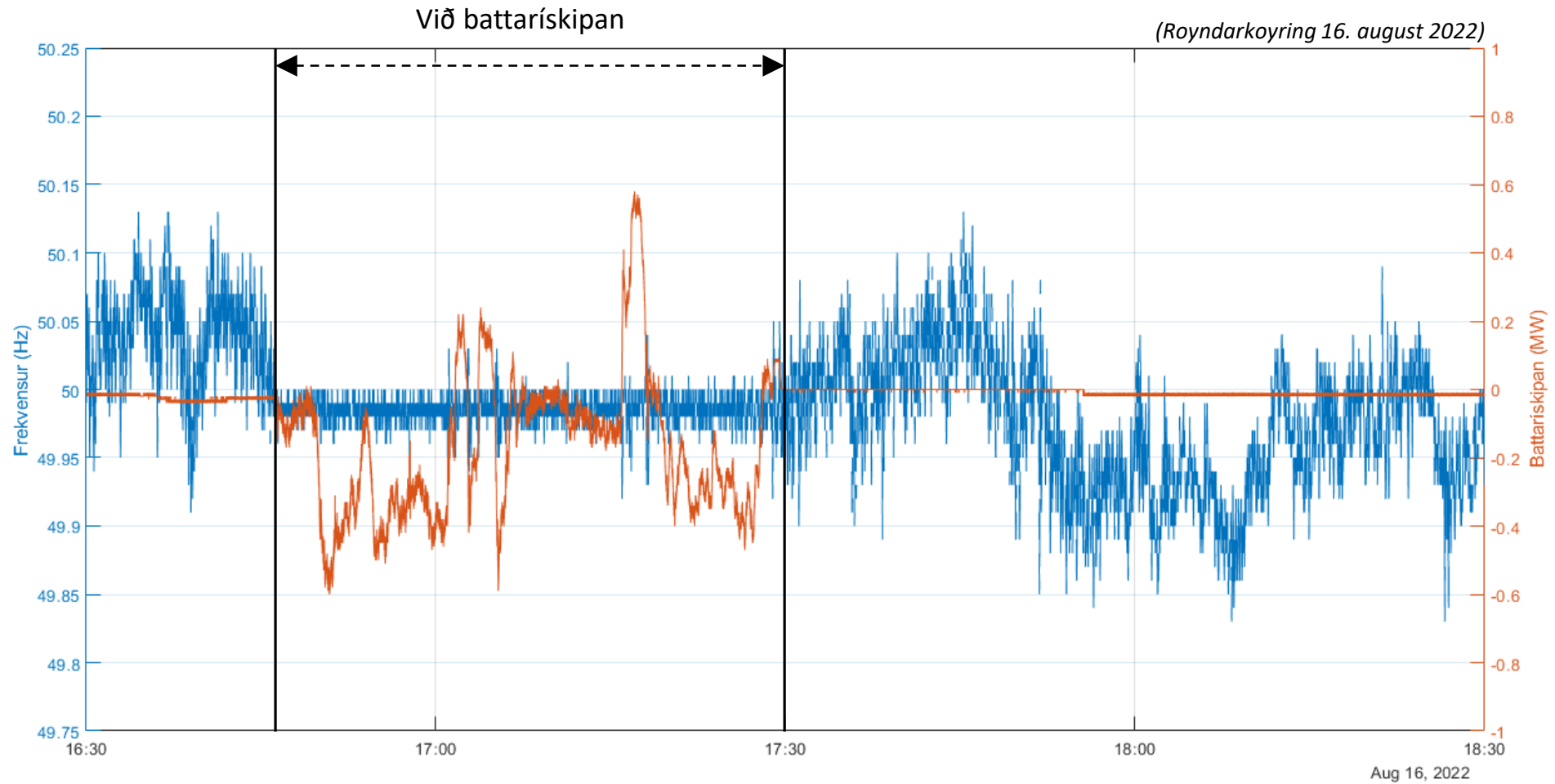








# Dæmi úr Suðuroy



Samanumtøka



# Samaamtøka

- Niðurstøður
  - Verandi mátar at gera útbyggingarætlanir kunnu ikki altíð lætt ítøkilig gerast og tí er neyðugt við einum nýggjum máta
  - Optimala orkusamansetingin er funnin og ávirkanin av ymsum kostnaðum og tøknum er identifiserað
  - Ein útbyggingarætlan framímóti 2030 er gjørd
  - Tað er neyðugt við øðrvísi mátum at tryggja støðufesti
- Arbeiði, ið skal gerast framyvir
  - Útbyggingarætlanin má dagførast regluliga
  - Støðufesti má kannast nærri bæði í Suðri og á meginøkinum
  - Meginøkið skal parametraserast og validerast betri



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Takk fyri