System Dynamics Society

Parallel Presentation

Wind Power's Uncertain Future in Uruguay:

A SD analysis of policy impacts and technological opportunities

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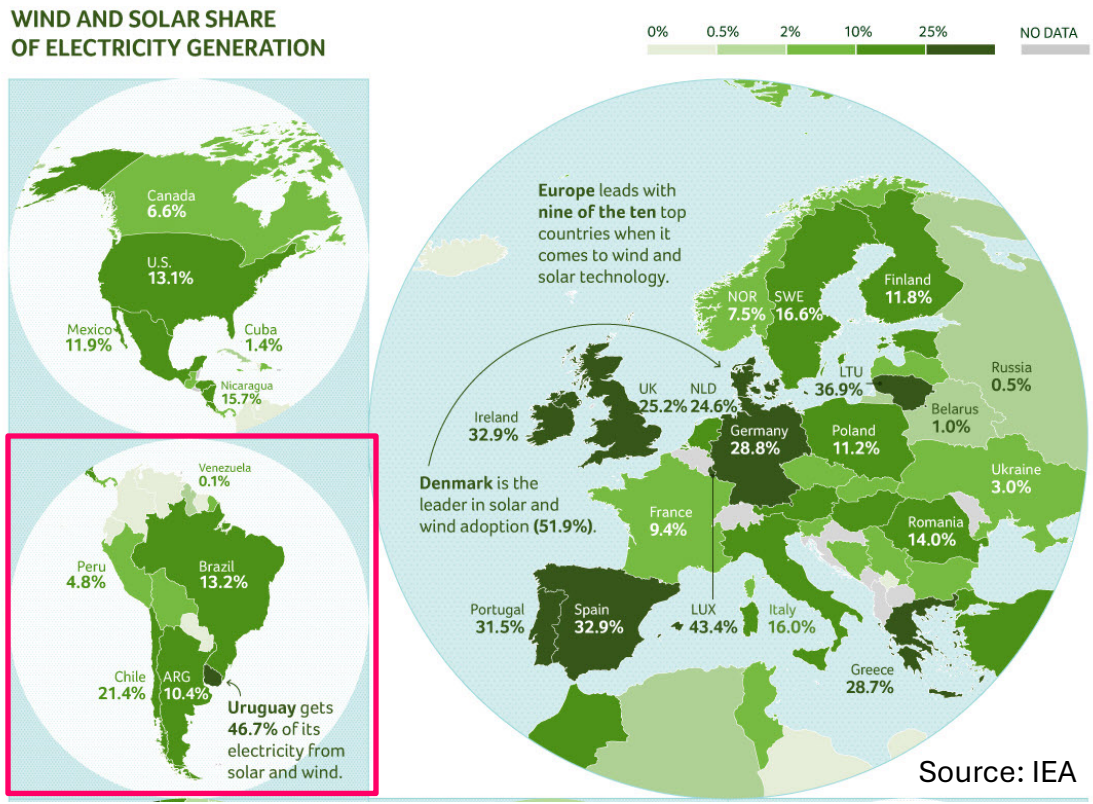
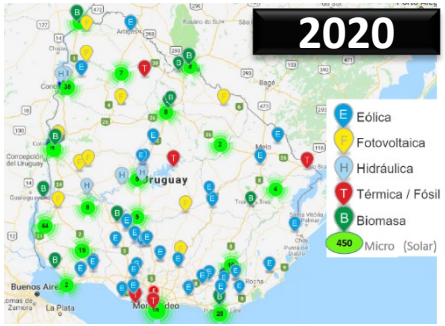
Problem Statement

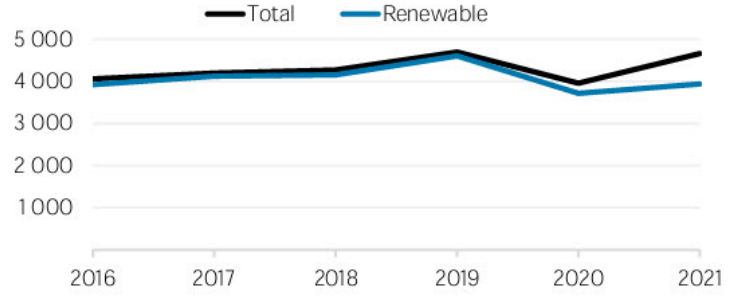


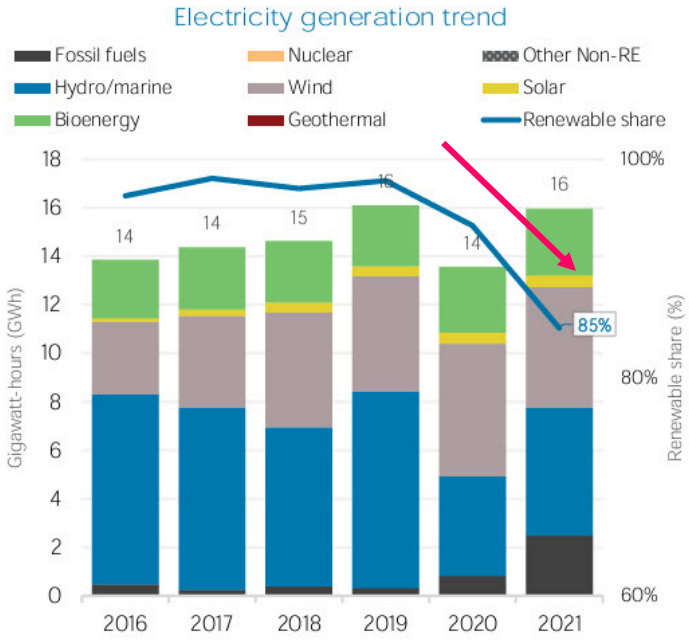


Problem Statement

ELECTRICITY GENERATION

Generation in 2021	GWh	%
Non-renewable	2 469	15
Renewable	13 492	85
Hydro and marine	5 273	33
Solar	483	3
Wind	4 991	31
Bioenergy	2 745	17
Geothermal	0	0
Total	15 962	100



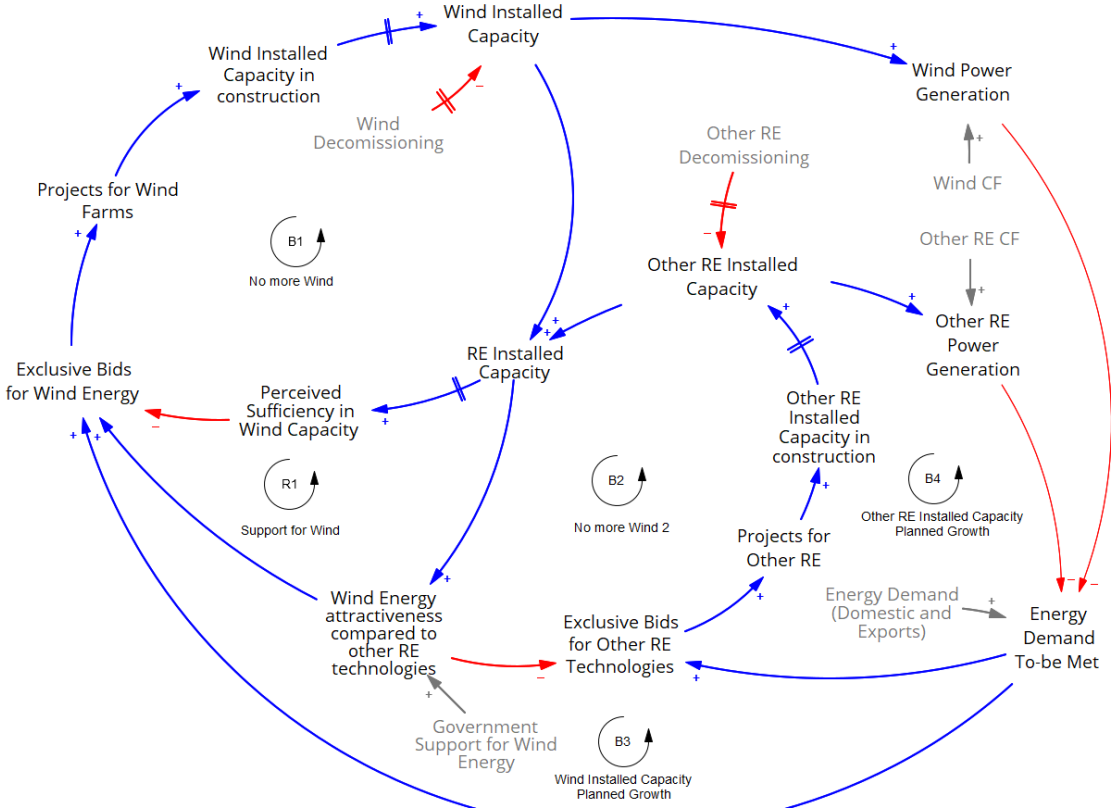


Source: IRENA

Given the absence of explicit plans for future capacity expansion, **will Uruguay face a decline in Wind Generation? And if so, what can they do about it**

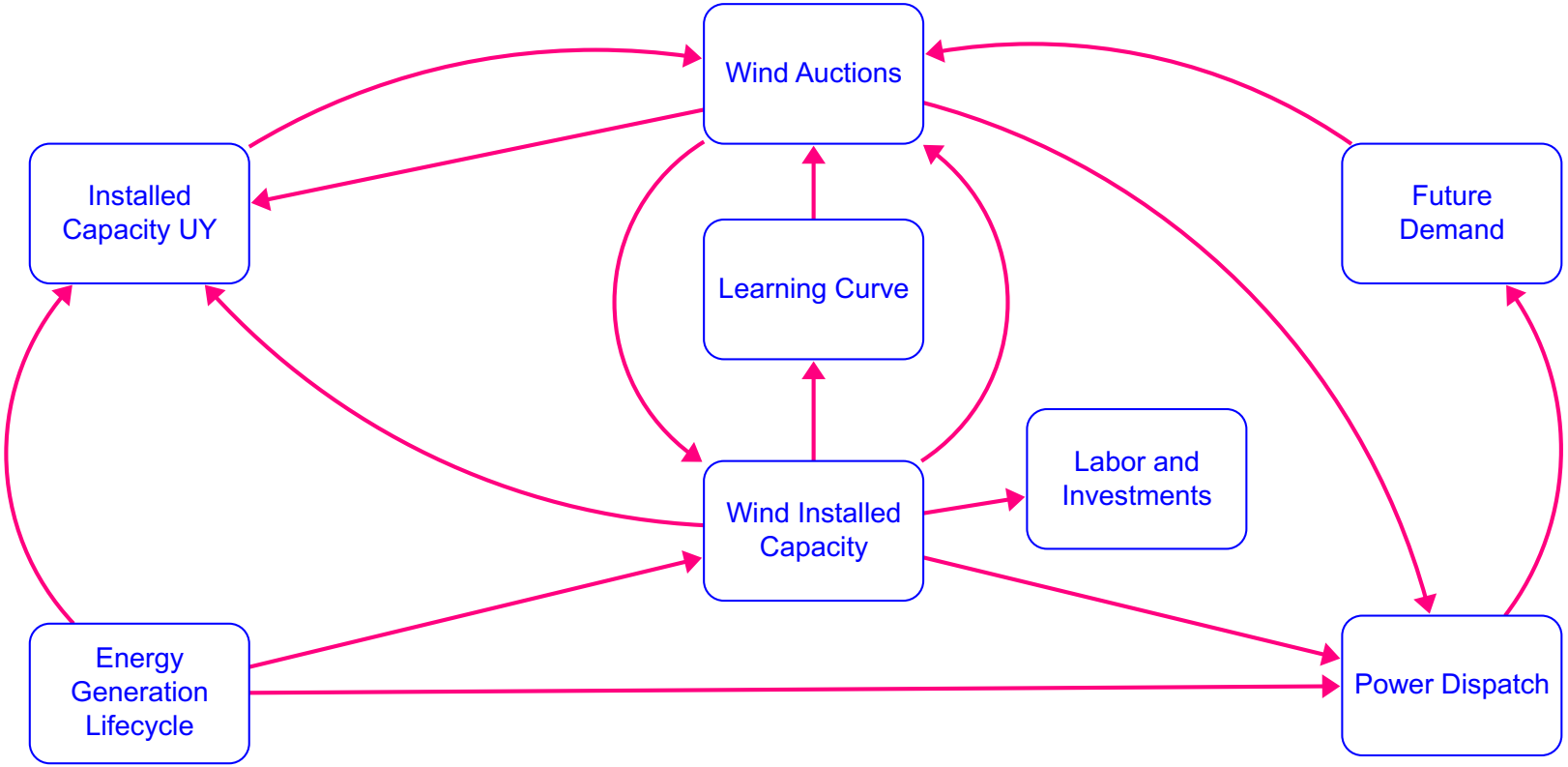
Dynamic Hypothesis

Wind is sufficient to meet Uruguay's current and future Energy Demand, so no new investments are needed.

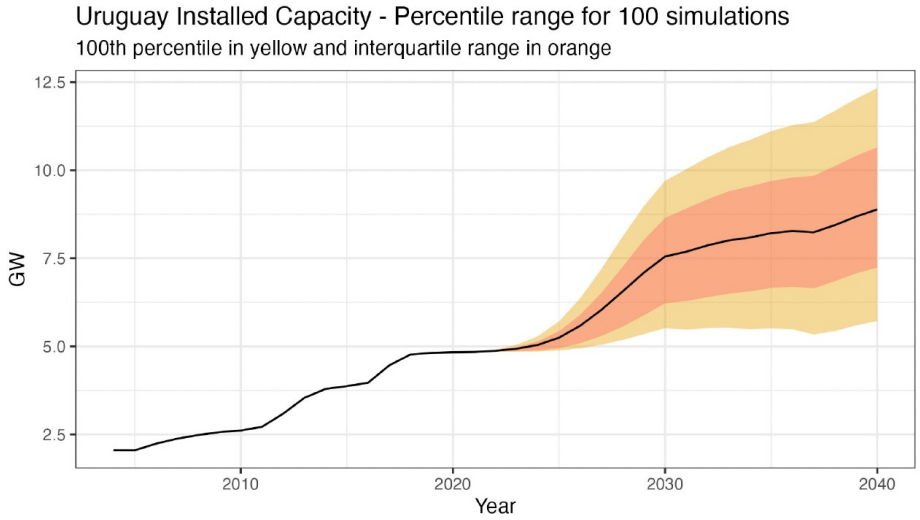


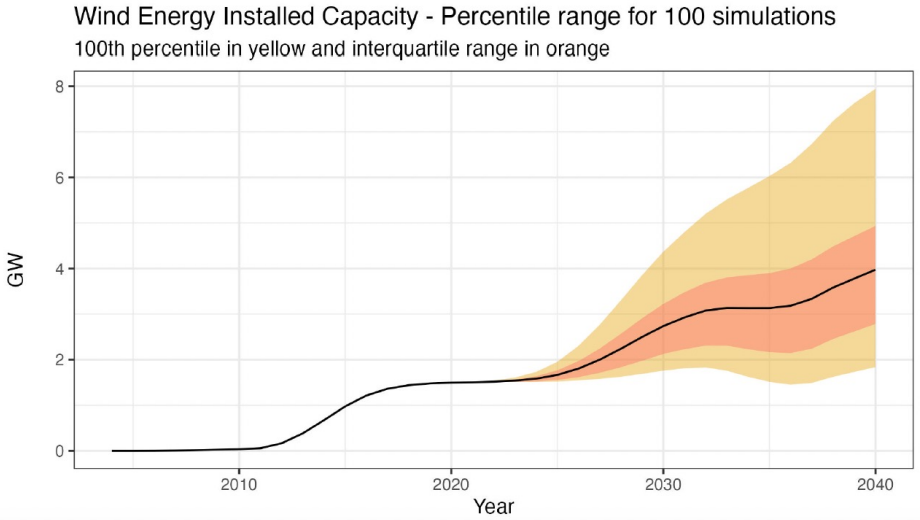
It's time to invest in other RE technologies, despite having better CF with Wind.

Model


Wind Auctions
Installed Capacity UY
Future Demand
Learning Curve
Labor and Investments
Wind Installed Capacity
Energy Generation Lifecycle
Power Dispatch

Sensitivity Analysis





Scenarios and Results

Scenario

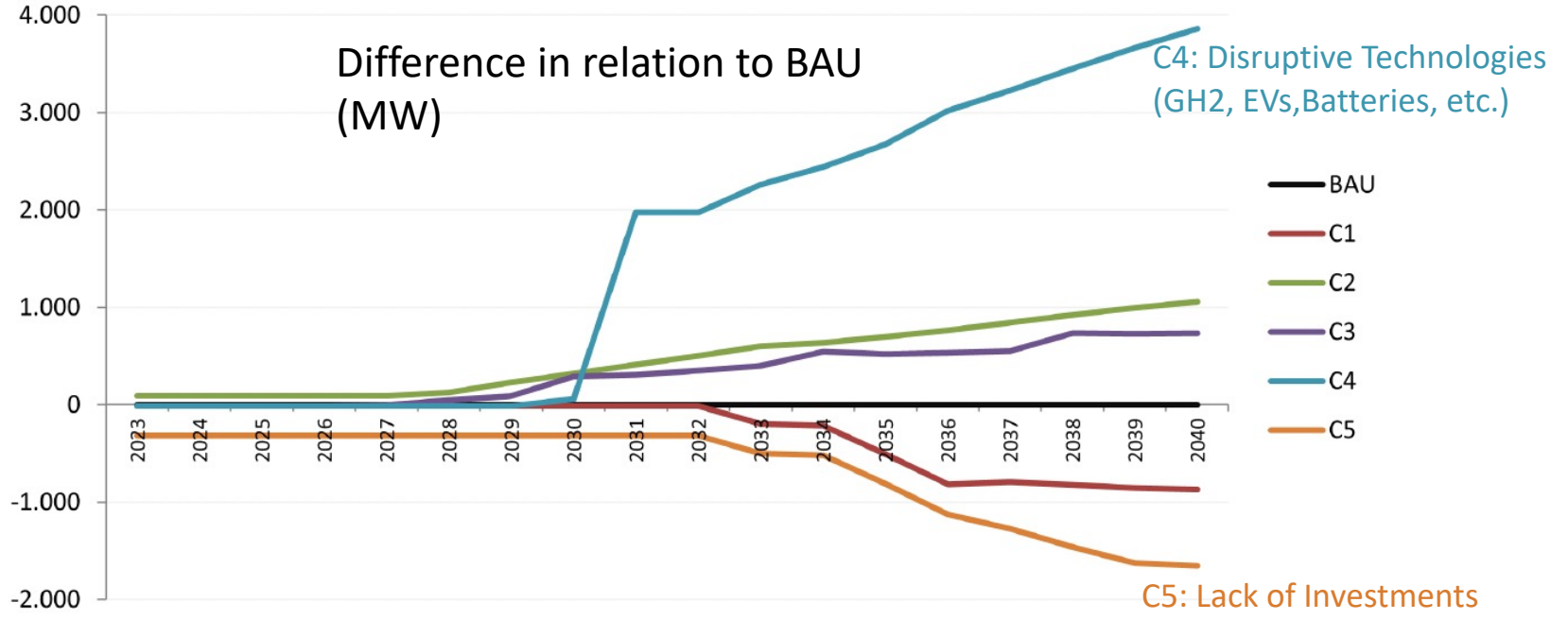
C1

C2

C3

C4

C5



C4: Disruptive Technologies (GH2, EVs,Batteries, etc.)

C5: Lack of Investments

Results

Scenario	Installed Capacity in 2040 (MW)	Installed Wind Capacity in 2040 (MW)	Investment (U$$ million)	Jobs generated
BAU	5,315	1,982	2,973	29,733
Scenario C1	3,865	1,109	1,553	16,640
Scenario C2	6,946	3,036	4,251	45,542
Scenario C3	6,459	2,715	3,802	40,731
Scenario C4	11,296	5,842	8,179	87,633
Scenario C5	3,651	328	459	4,916

Conclusions

- Green Hydrogen (GH2) will likely boost investments in the Wind Industry, according to C4.
- In parallel climate change will impact Hydroelectric generation (C2), and therefore will require complementarity with other RE generation technologies.
- Therefore, the Energy Policy Plan for Wind Energy expansion should be revisited by local authorities (to avoid C5).

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Acknowledgements:

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