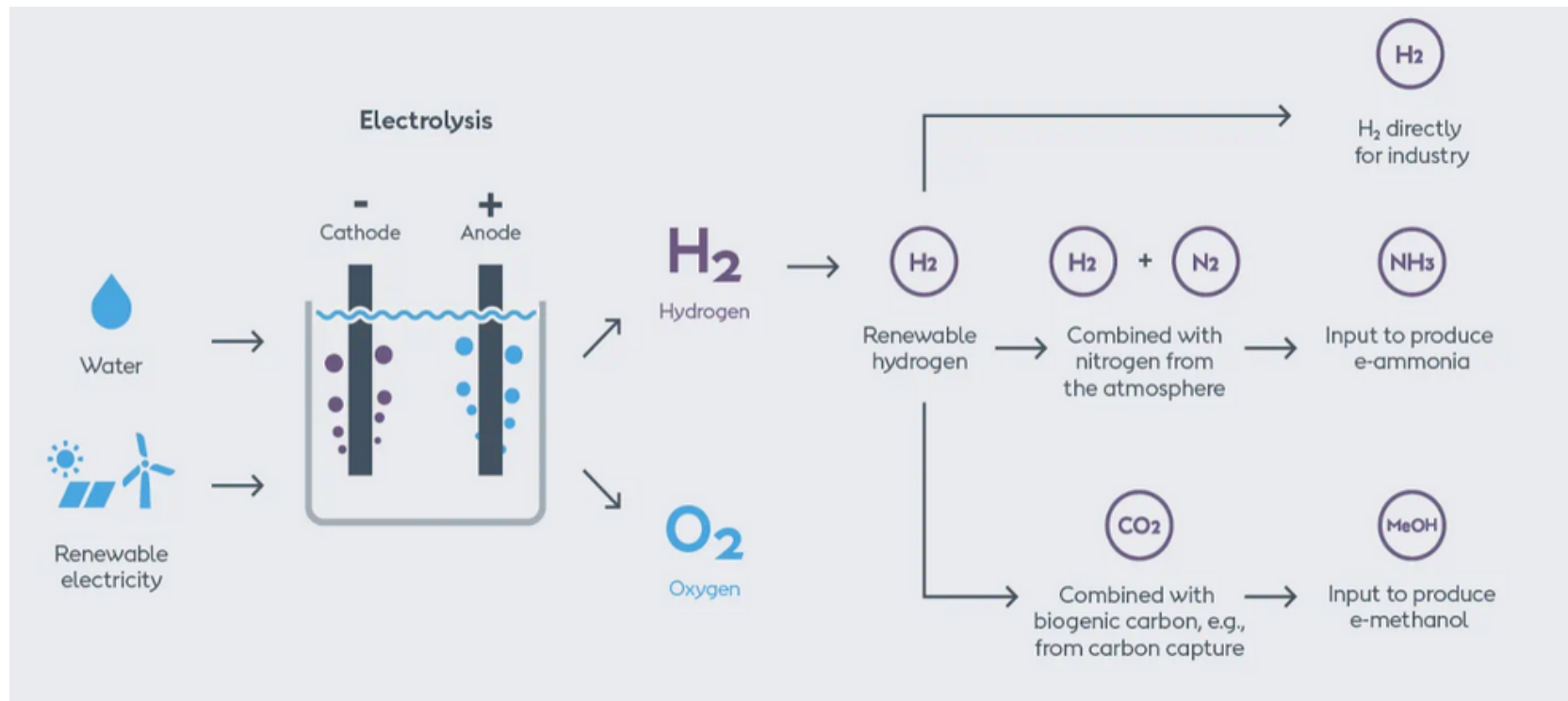


# Power-to-X in Norway

by Léa B., Daphne C., and Vedant S.

## What is Power-to-X (P-t-X)?



P-t-X refers to converting renewable electricity into carbon neutral substitutes for fossil fuels. The process makes green hydrogen, which can be converted to other fuels.

## Is P-t-Hydrogen Financially Viable?

2022



**Unlikely**  
*H2 is too expensive today. Only replacing truck diesel with H2 could be financially viable. However, truck-related data is unreliable.*

2030

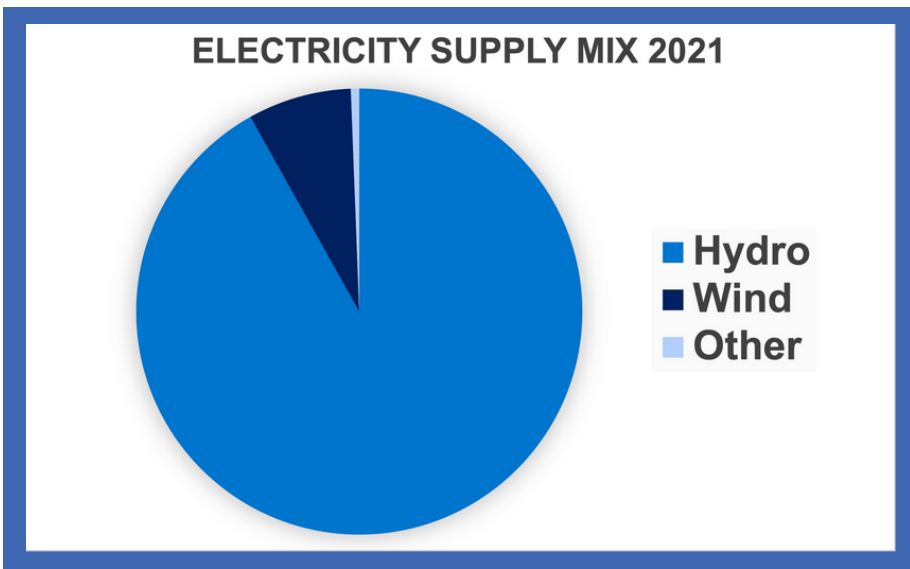


**Maybe, thanks to NEL**  
*Only 1 company, NEL, can produce H2 at €1.5/kg in Norway. This could replace oil in maritime, air, truck transportation and industrial heating.*

**P-t-H2: Not Viable**  
*Natural gas & Coal*  
 are so cheap that Norwegian H2 cannot replace them. Further innovation or government subsidies could make this transition work.

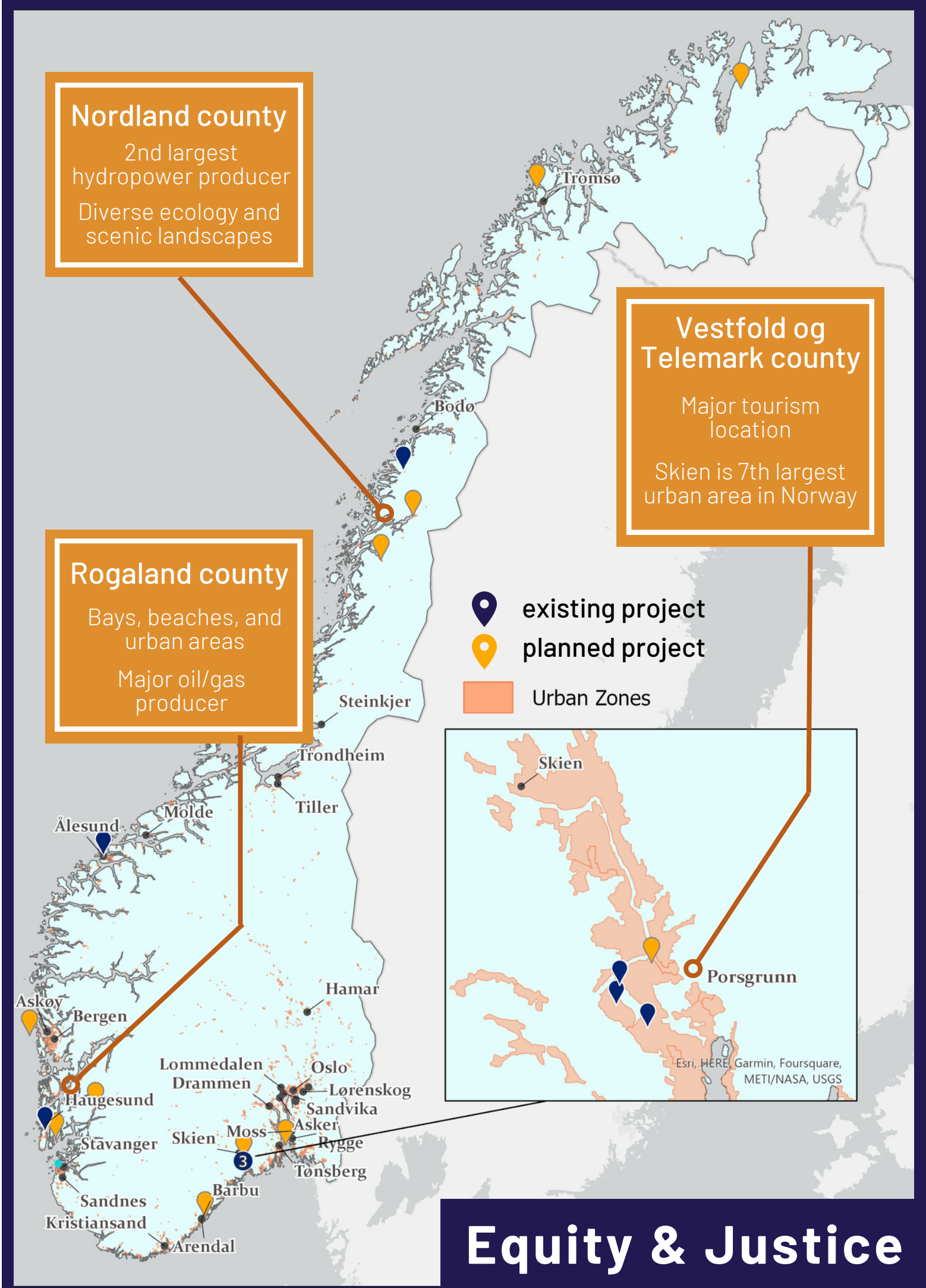
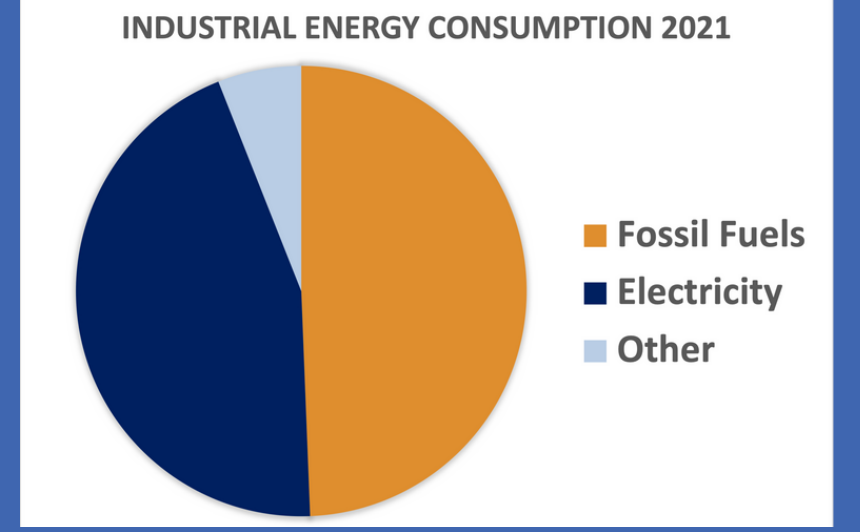
to conclude:  
 • P-t-X pathways are mostly unaffordable  
 • High capital costs will burden early-adopters  
 • One cheap provider isn't enough to transition in Norway

## Model Input Data Collection



Norway's power sector provides a zero-carbon electricity mix.

Carbon-neutral P-t-X fuels are candidates to replace fossil fuel demand for industry and transportation sectors.



## Equity & Justice

Recommendations for P-t-X best practices:  
**Rogaland:** Quantify emissions savings & health benefits from PtX  
**Vest. og Telemark:** Ensure PtX clearly contributes to local economy  
**Nordland:** Limit resource impact w/ community-developer relations

Damman, S., Sandberg, E., Rosengren, E., Pisciella, P., & Johansen, U. (2020). Largescale hydrogen production in Norway—Possible transition pathways towards 2050 (No. 2020-00179).

Lund, H., Thellufsen, J. Z., Østergaard, P. A., Sorknæs, P., Skov, I. R., & Mathiesen, B. V. (2021). EnergyPLAN – Advanced analysis of smart energy systems. Smart Energy, 1, 100007. <https://doi.org/10.1016/j.segy.2021.100007>