Decarbonization of industries

Will new industrial supply-chains alter where industries are located?

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A longer title …

Decarbonization of industries:

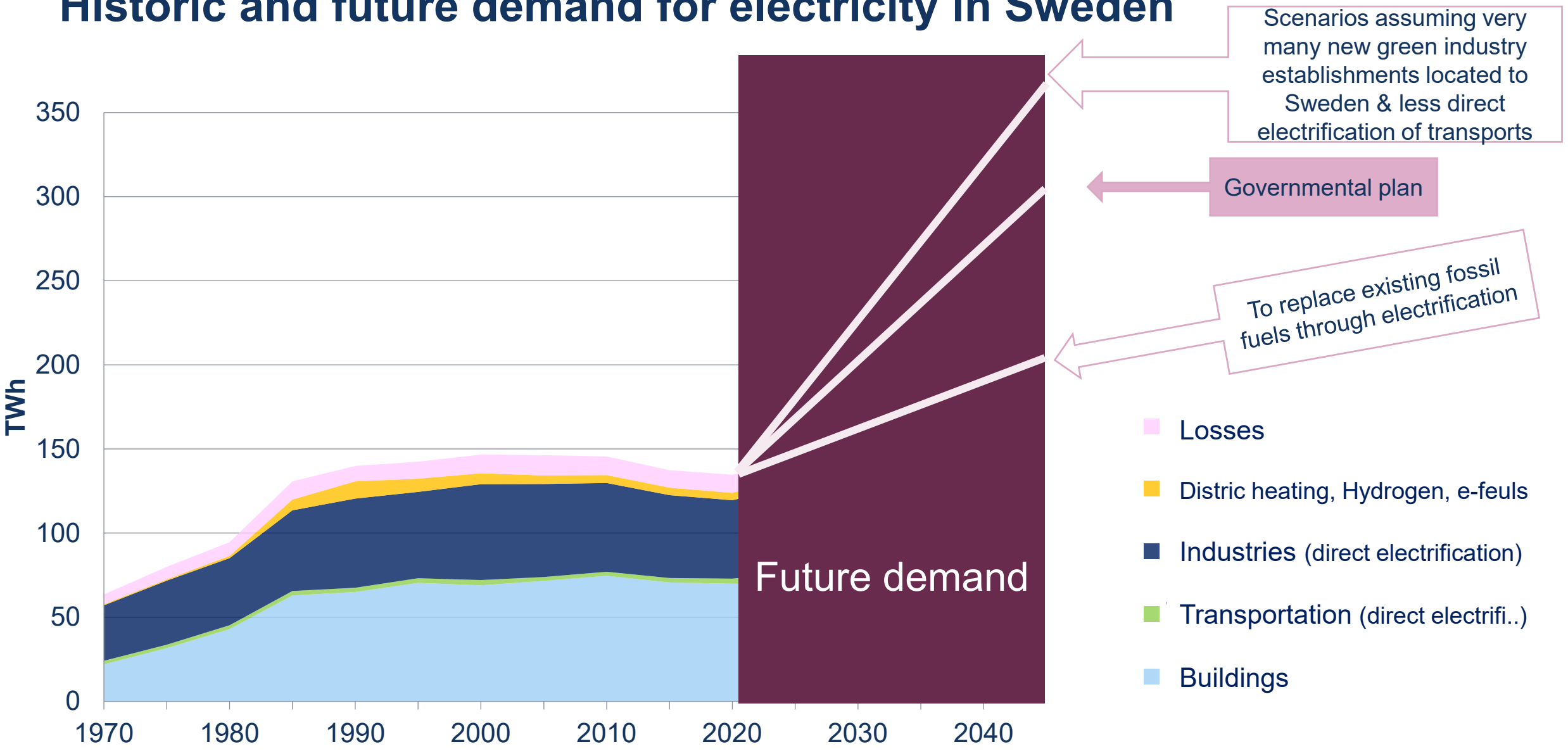
Will new industrial supply-chains alter where industries are located?

What is needed to change the iron ore to vehicle-steel supply chain?

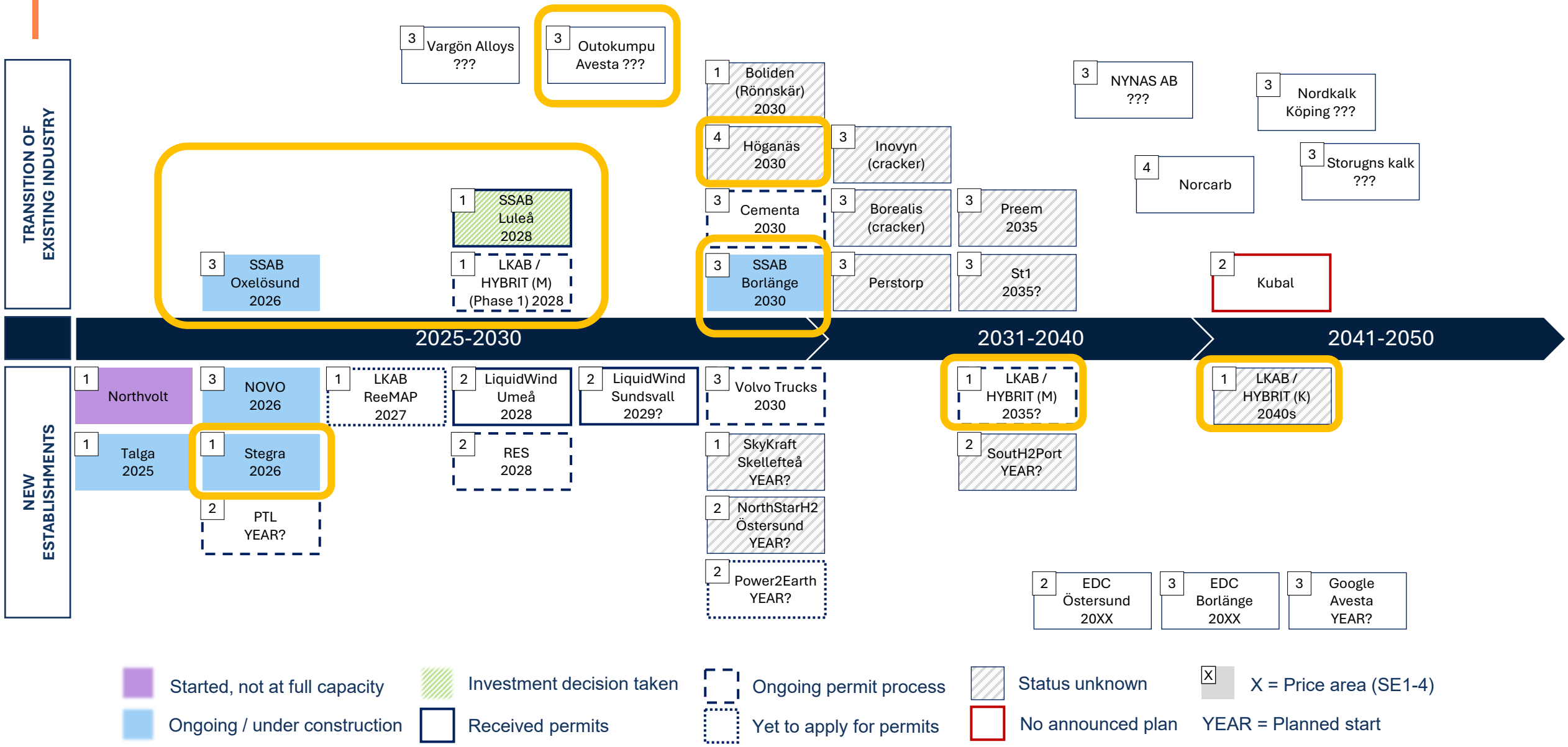
What is impacting the location?

And how does it impact the national assessment on how to decarbonize the industry sector?

Historic and future demand for electricity in Sweden

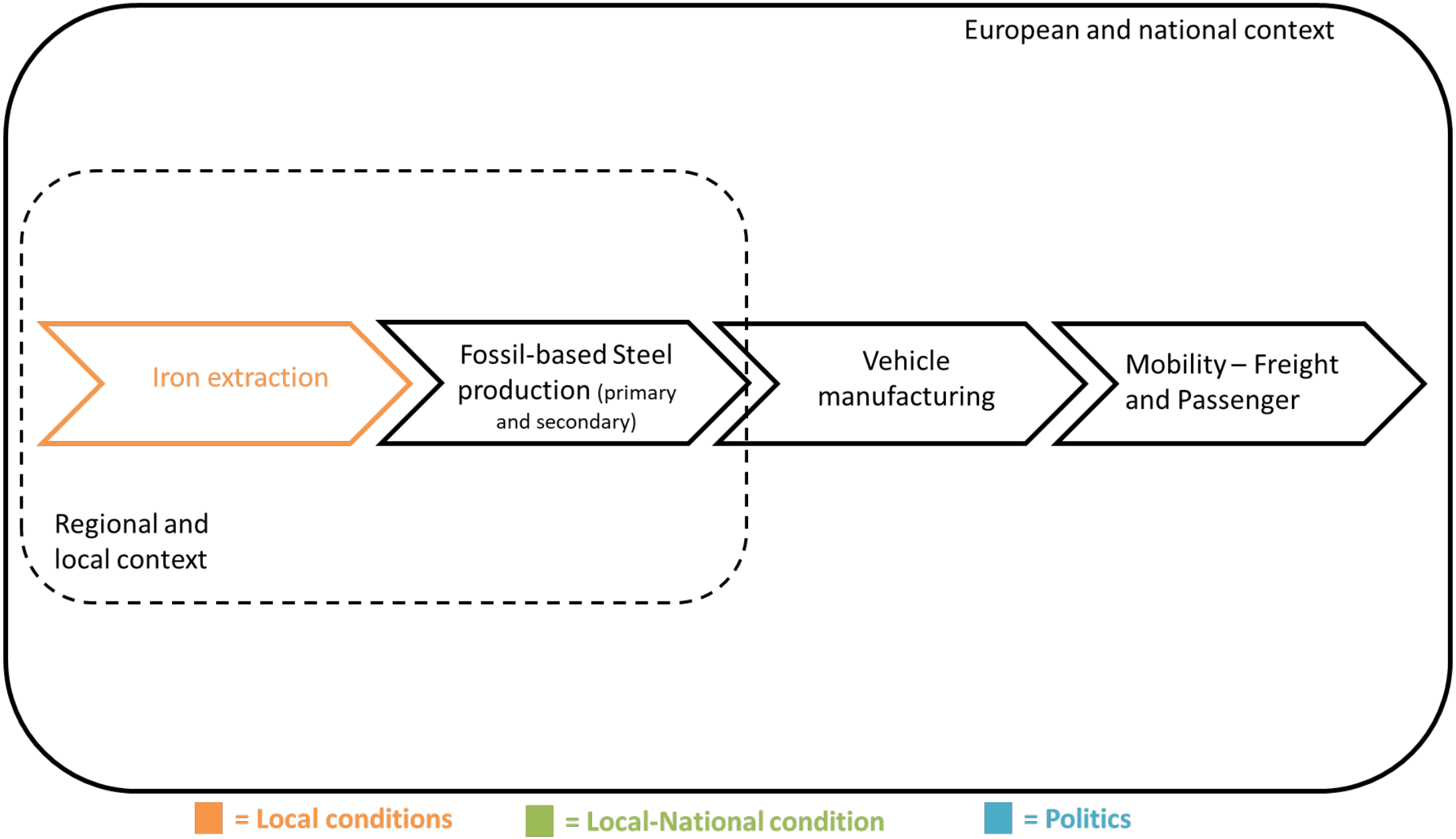


TRANSITION PLANS IN **EXISTING** AND **NEW** INDUSTRY SITES

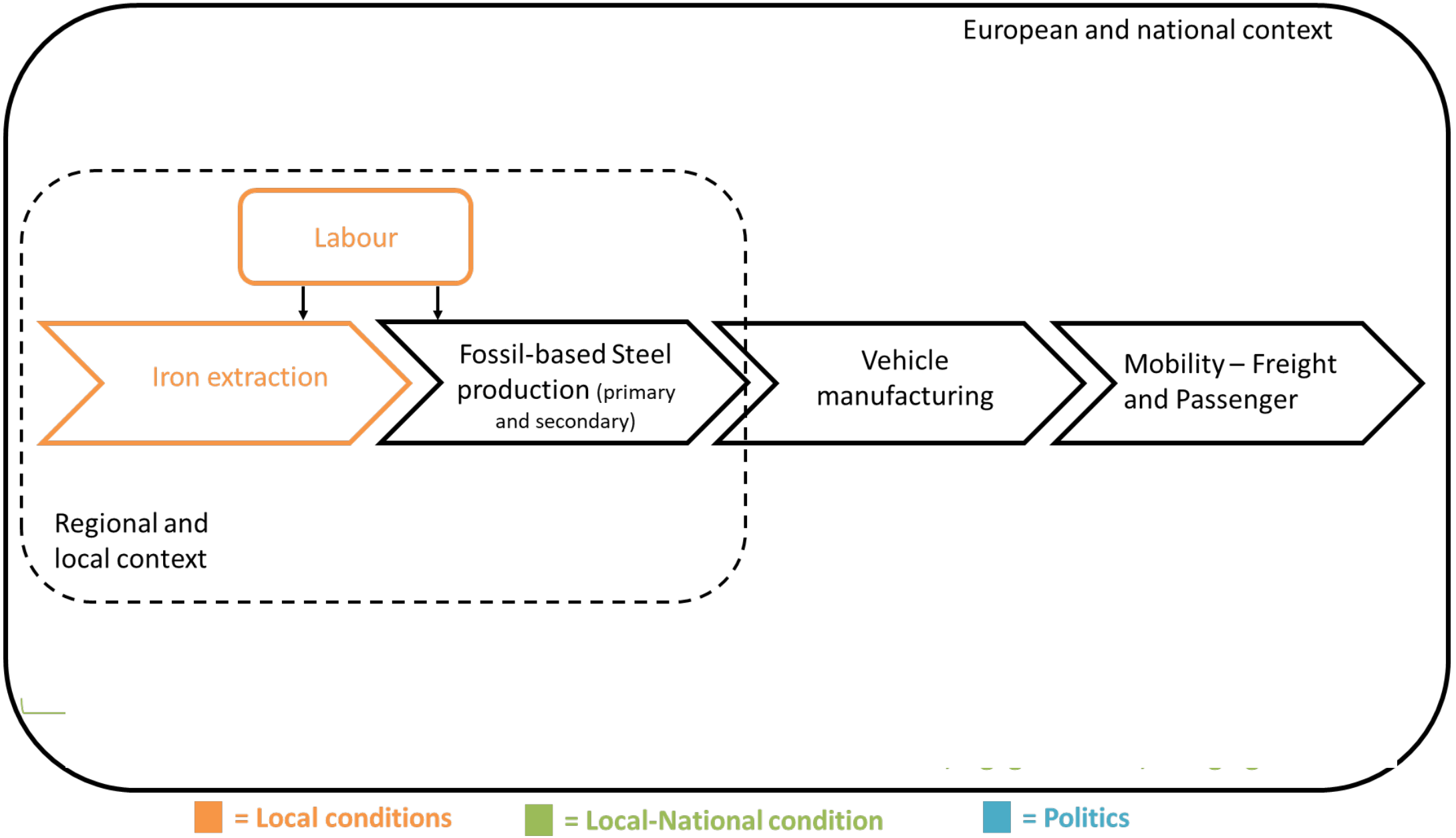


The development of new fossil free supply-chains, from iron ore to vehicles
– Policies that support the transition

Refer to the study as: Rootzén, J, Söderholm, P, Zetterberg, L, Krook-Riekkola, A, Karltorp, K. & Johnsson, F (2024) Framväxten av nya fossilfria värdekedjor från malm till fordon - Styrmedel som möjliggör omställningen. (In English: New Fossil-Free Value Chains from Ore to Vehicle – Policy Instruments Enabling the Transition). Scientific report. Available: https://ltu.diva-portal.org/smash/record.jsf?pid=diva2%3A1900484&dswid=1741



Source: Rootzén et al (2024)



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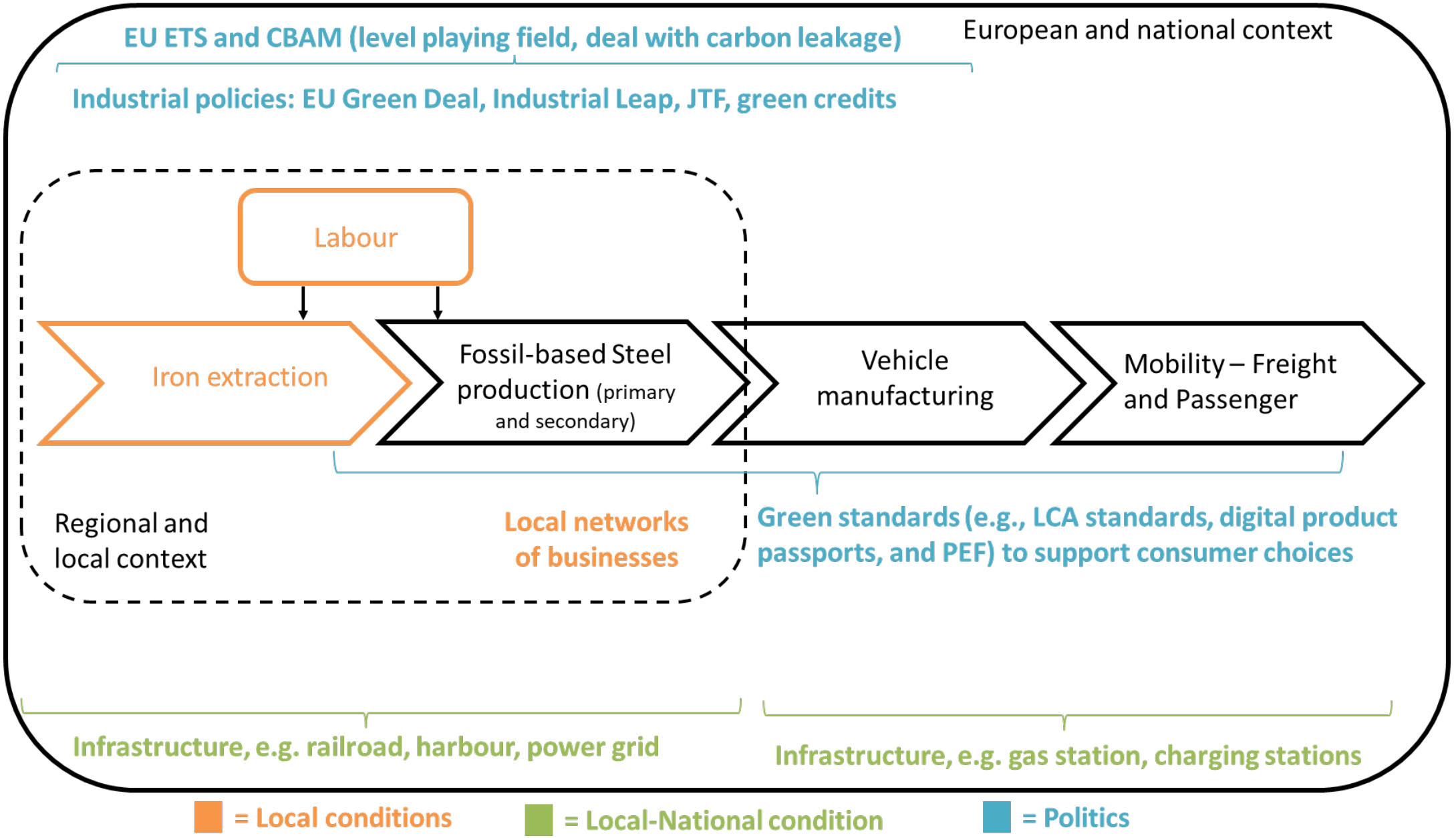

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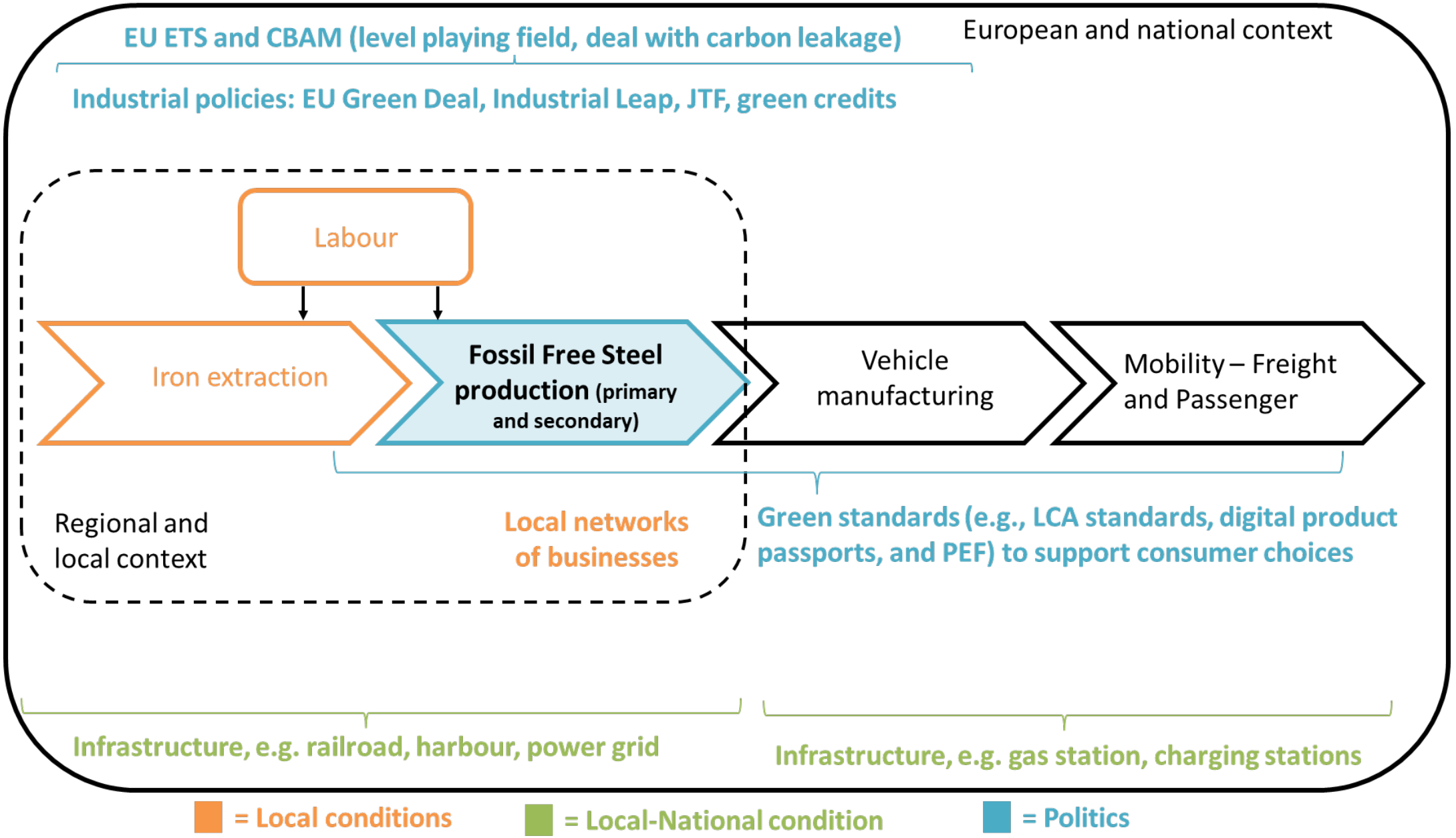

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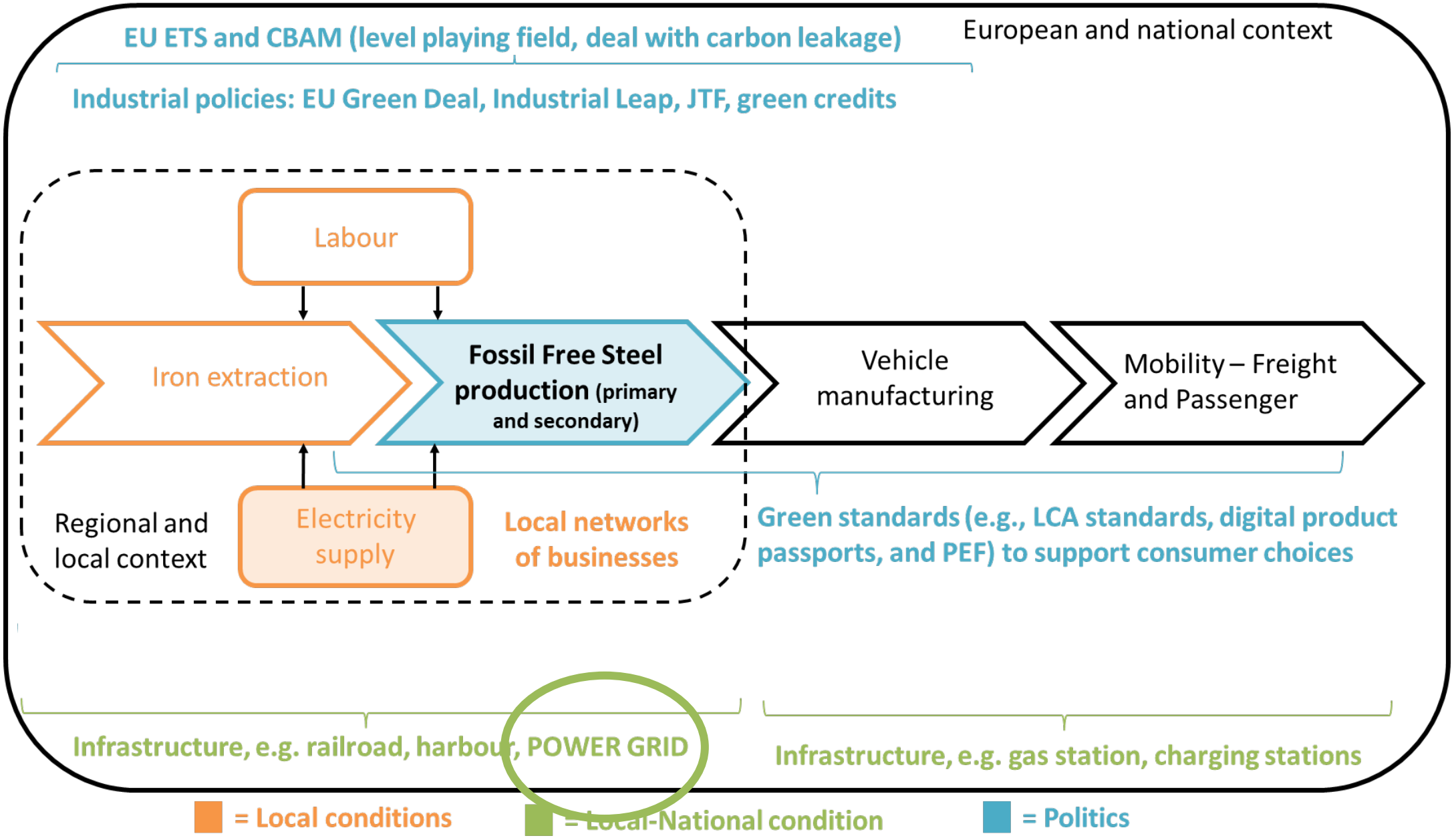

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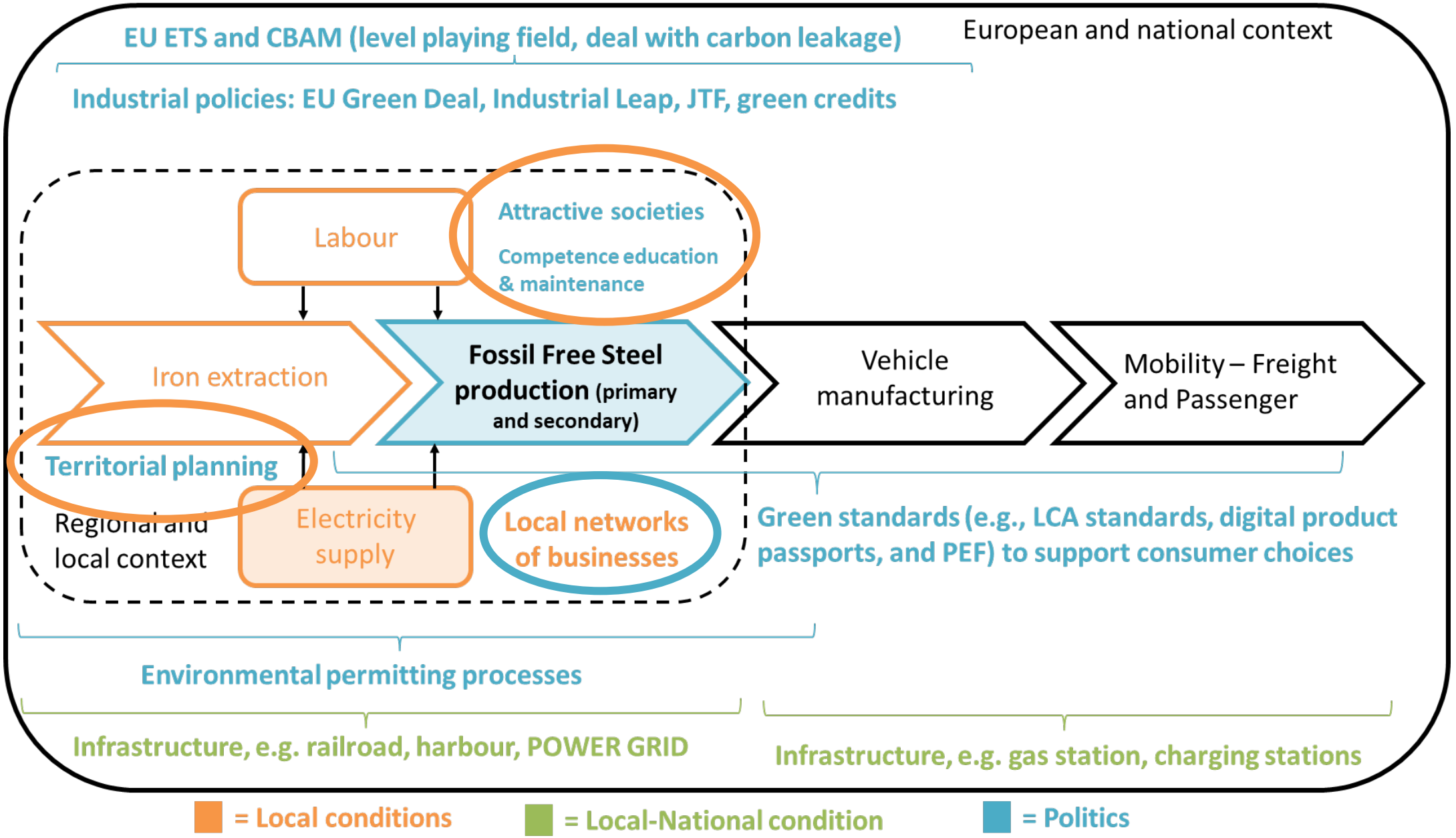


Source: Rootzén et al (2024)

Fossil free steel – Sweden's comparative advantages/disadvantages

Source: Person (2024). Stålindustrins val av teknikspår – statens roll. Report 2024:09. Tillväxtverket, Sweden.

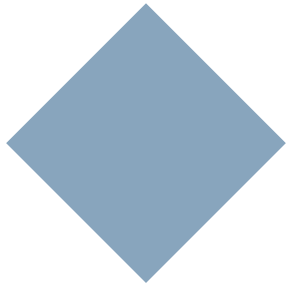
Advantages

- Closeness to iron ore
- High iron/steel expertise within the Swedish steel-cluster
- Low electricity price (relatively others)
- Closeness to biomass for producing synthesis gas

Disadvantages

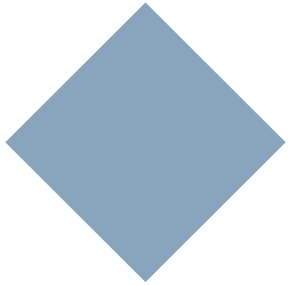
- Distant from steel purchasers and scrap
- Sweden is not a "gas-country"
- No gas pipelines in connection with existing iron-steel industries.
- Energy intensive industries are spread along the long coast (other countries benefit form industrial zones with many industries at the same place)

Takeaways to consider in national assessment on how to decarbonize the industry sector



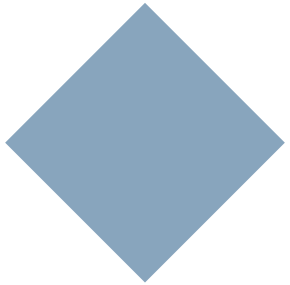
Conditions:

What are the comparative advantages and disadvantages in the particular country?



Politics:

What is the country willing to do, what are other countries doing?



Other countries:

Future markets: Who has best conditions to have low production costs?

Future competition of raw material: Will it be possible to continue to import the same amount of raw material?

Identifying national pathways for how to decarbonize the industry sector – Modell based scenario analysis

What do vary between scenarios – Important trends that will impact the future energy system and/or the energy exchange:

- Which green industrial establishments will be realized, where (in which power region) and when (year)?
- How much wind power will be permitted in the respective countries, onshore and offshore?

What to vary in sensitivity analysis – System environment:

- European energy prices: electricity, oil, gas, coal, hydrogen, biomass, biofuels
- EU ETS prices: ETS1 & ETS2
- Technology development: Electrolysis, DRI-H2, high-temp-HP, offshore wind power, SMR, fusion, batteries, flexibility

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