

# Green Windows of Opportunity in Latecomer Countries

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# Background

- The green transformation of the global economy is underway and accelerating.
- The green transformation is a major techno-economic paradigm shift, and compared to earlier paradigm shifts, greening is more deliberate and directed.
- **A big question arises:**

What does the green transformation mean  
for latecomer development?

It could increase entry barriers making latecomer development more difficult, but it may also open **windows of opportunity**.

## Research questions

- Is the green transformation opening new latecomer development opportunities?
- What are the conditions and dynamics of green latecomer development?
- Do we need new conceptual frameworks to understand the determinants of 'green latecomer development'?

# Empirical studies on China

- Focus on experiences of renewable energy industries in China
- Insights combining qualitative sectoral case studies with quantitative analysis (patent analysis and simulation models)
- Seven articles brought together in [\*Industrial and Corporate Change\*](#), Volume 29 (5) (2020)

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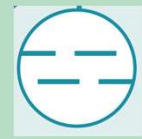
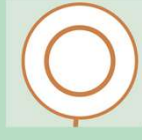

## Green windows of opportunity: latecomer development in the age of transformation toward sustainability

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## Sectoral studies

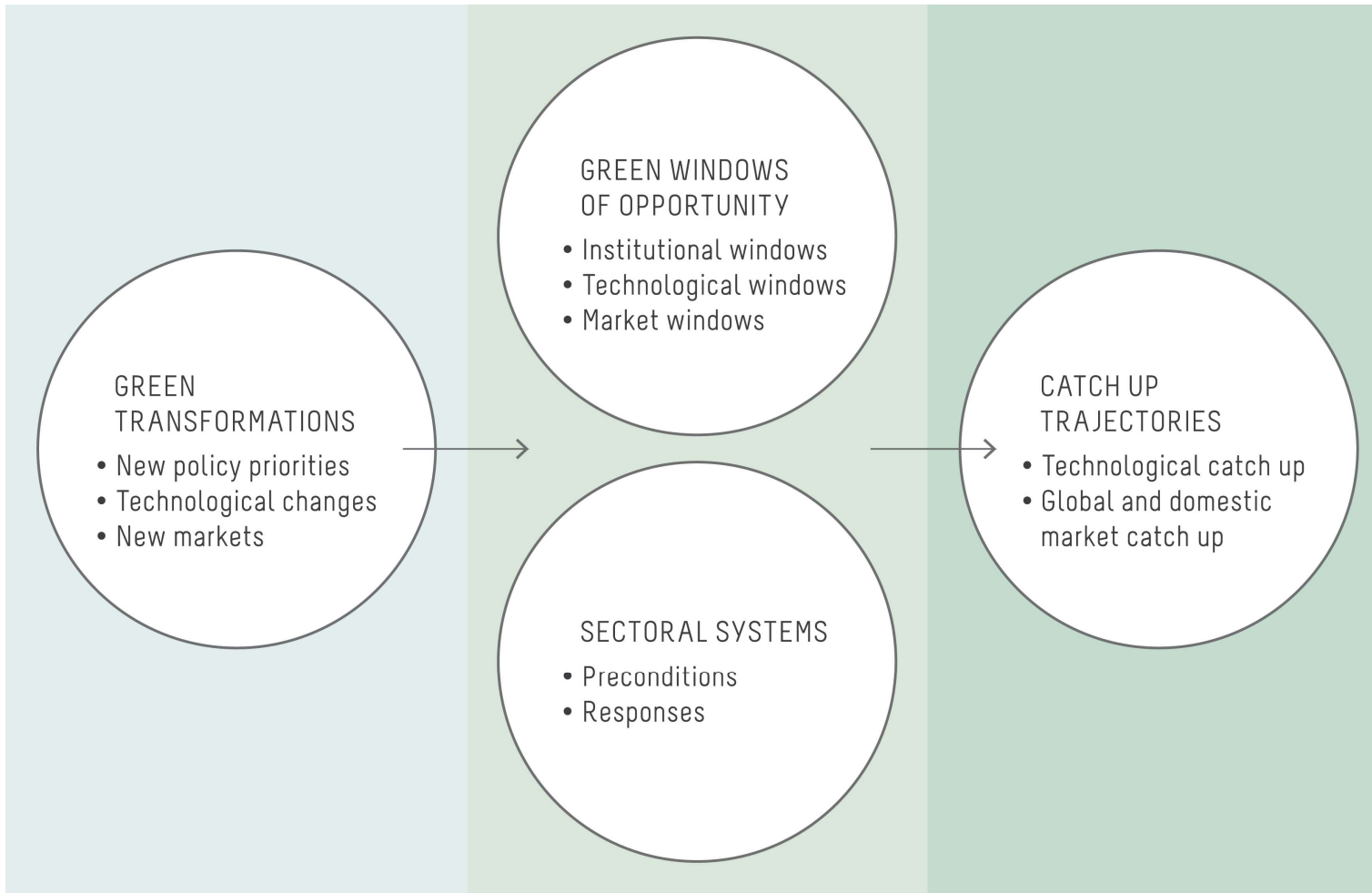
- Biomass 
- Concentrated Solar Power 
- Hydropower 
- Solar PV 
- Wind power 

## Why a new framework?

- Other frameworks for the analysis of low carbon technologies are mainly concerned with the development and deployment of such technologies, rarely situating the discussion in the context of latecomer development;
- Existing frameworks on latecomer development do not focus on the green economy;
  - Latecomer economies should from the outset develop differently rather than catch up along established pathways

***NO: grow first and clean up later model!***

# GWO framework



1. Green Windows of opportunities
2. Sectoral system of production and innovation: preconditions and responses of public and private actors
3. Catch up trajectories resulting from the interactions of GWO with stakeholders' actions

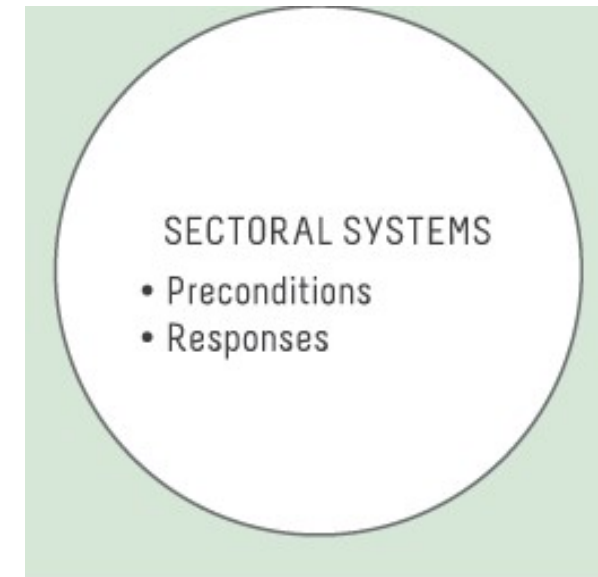
# Green windows of opportunity

- GWO are mainly endogenous, and can be created by governments and influenced by domestic and global environmental and industrial policies;
- This is different from previous catch up processes in industries such as cell phones or steel production in which windows of opportunity are predominantly exogeneous, created by technological or market changes.
- Examples from China are:
  - 2006 Renewable Energy Promotion Law;
  - Golden Sun Demonstration Program;
  - Ride the Wind Program.

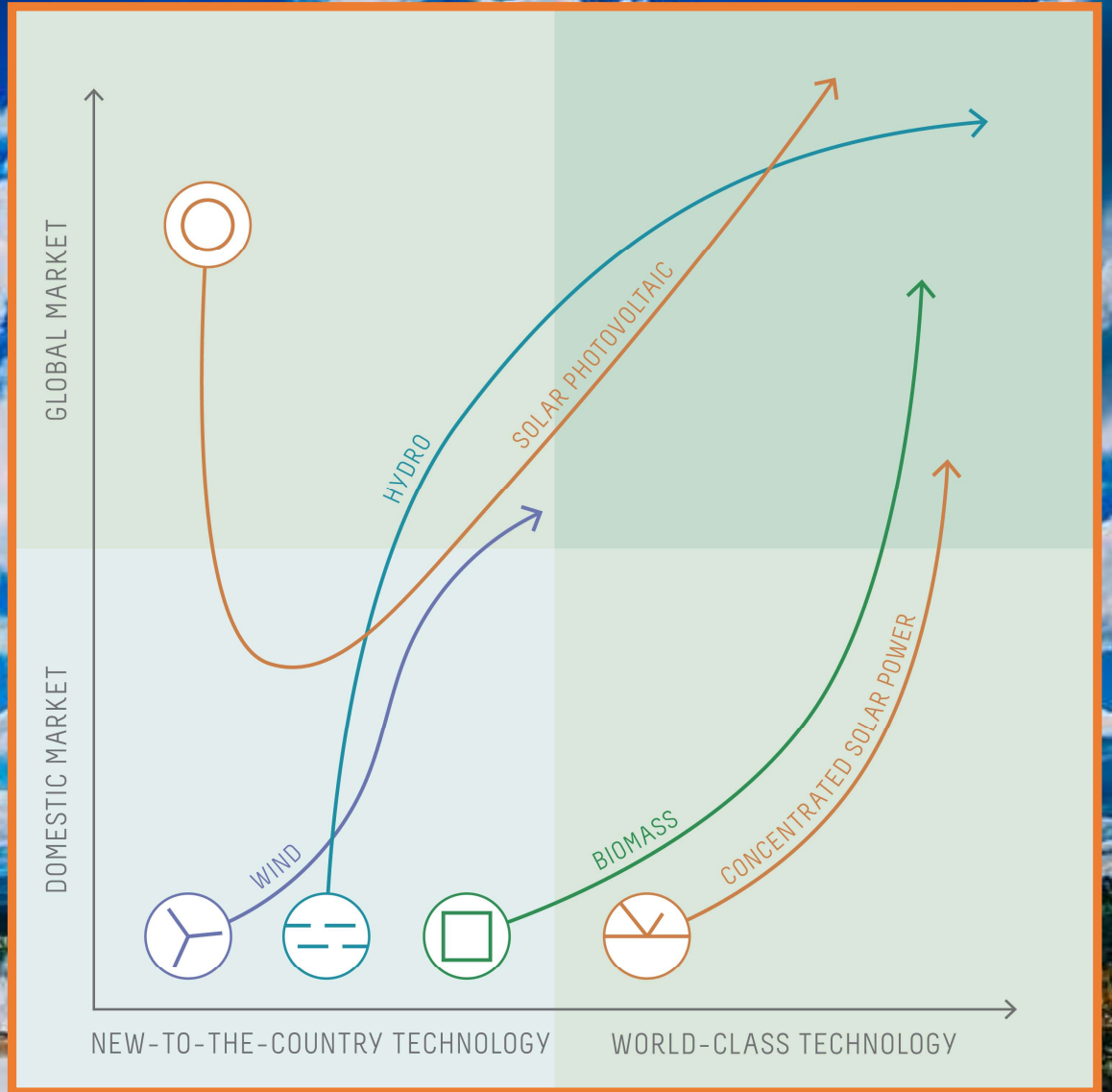


# Sectoral systems: preconditions & responses

- The exploitation of GWO depends on the existing preconditions and on the responses of firms and other public and private actors;
- **Technological maturity and tradability** of green technologies significantly affect sectoral trajectories.
- Examples from China:
  - Acquisition of world class technology combined with capital investments and building of organizational capabilities (biomass & solar);
  - Acquisitions of, mainly, European companies (biomass);
  - Public R&D (hydro energy & CSP);
  - Intensiveness of the interactions among lead firms, suppliers, technology providers and financial institutions within the sectoral innovation systems (solar PV).

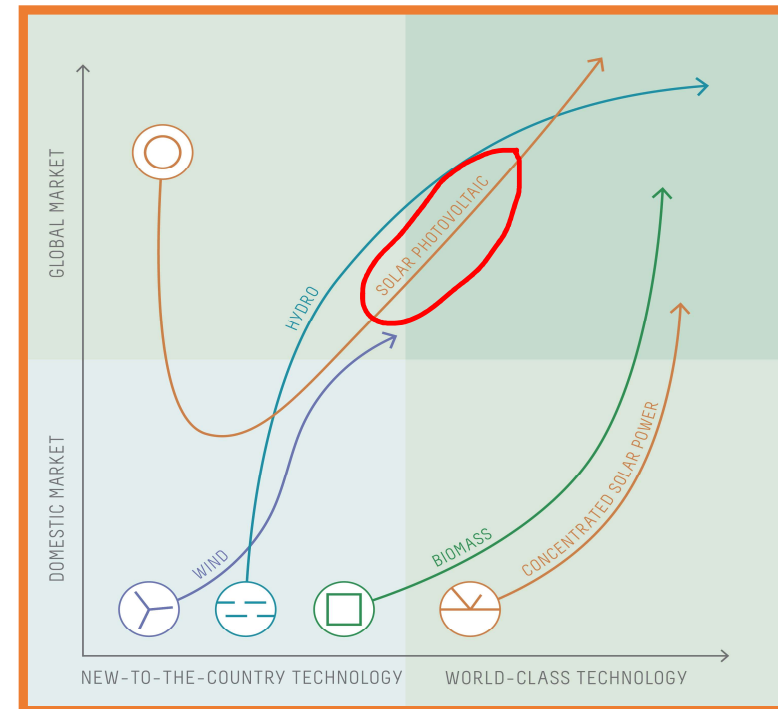






## The Chinese solar PV trajectory: From learning from exporting to domestic strengthening and then to market and technological global leadership

- ❖ Solar PV started in the global market exporting solar panels made with imported technology, so learning from export.
- ❖ After a fall in global demand, Chinese companies substituted the international demand with domestic demand thanks to the incentives created by public policy.
- ❖ Huge investments in building domestic technological capacity and domestic capacity in the whole solar value chain.
- ❖ Chinese companies went back to international markets as technological and market leaders.



## Key takeaways

- Common finding: new *green windows of opportunities* are opened by institutional (policy) changes;
- There is significant variability in catch up trajectories at the sector level;
- Sectoral characteristics and technological maturity are key in explaining the variability of the trajectories;
- China took **active measures** to enhance technological capabilities and build **open and strategic** national and sectoral innovation systems through trade and investment policies and internationalization of R&D, achieving fast catch-up and even leadership in several cases;
- The emergence of China, and potentially, other latecomer countries in renewable energies may have an internationally beneficial effect by reducing the price of these technologies and mobilizing finance and technology for more affordable green energy systems in the global South.

## Policy implications

- Policymakers need to **co-design policies** in otherwise distinct domains: environmental and energy policies as well as industrial and innovation policies.
- **Calibration, coordination and prioritization** of policy instruments and the timing of interventions can deeply influence the industrialization outcomes.
- Support policies **need sector-specific approaches and sequencing.**
- International organizations and national governments can **sustain institutional change-led, mission-oriented GWOs**, facilitating the entry in the global market of new champions in the green economy and expanding the diversity of green pathways.



Thank You!

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