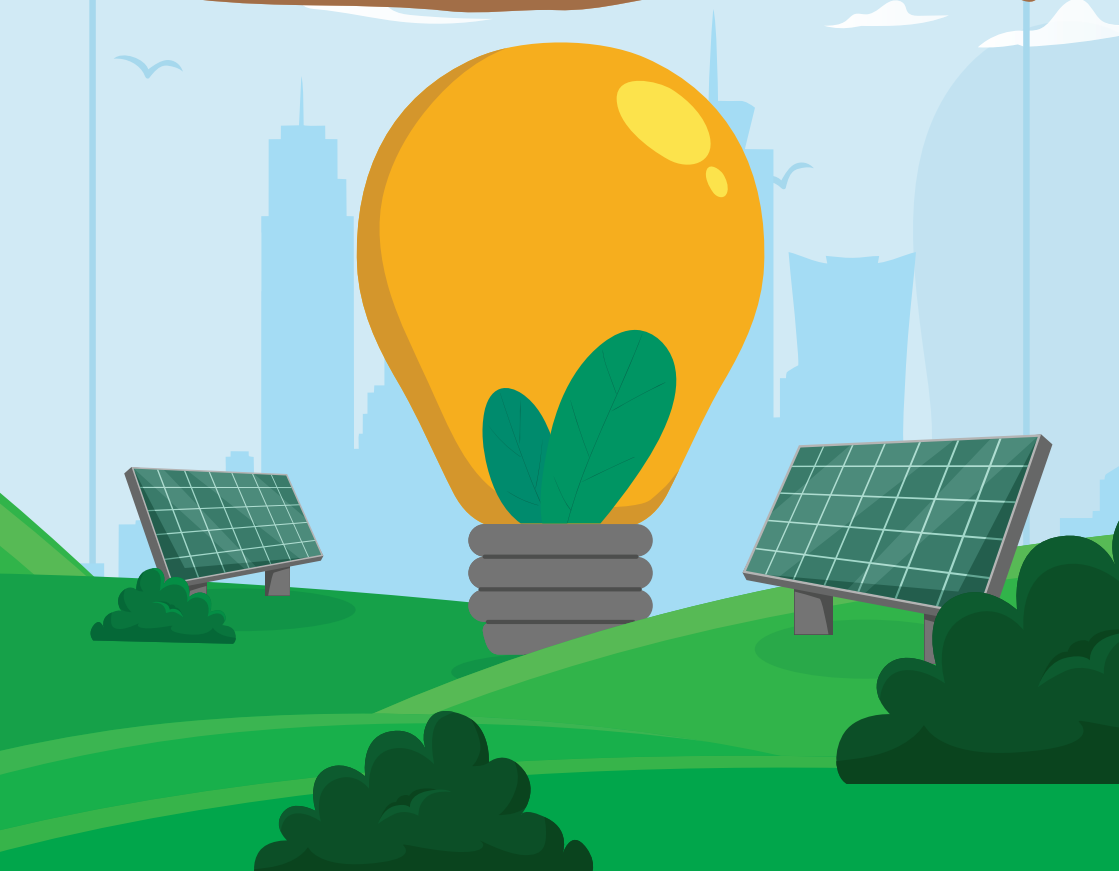


THE RISE OF GREEN PROTECTIONISM

Exploring the Policy Implications of Local
Content Requirements on Green Technology
Industry Innovation Efforts in Indonesia





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INTRODUCTION

It is undeniable that today, the manufacturing industry stands as one of the key pillars for driving a country's economic growth. As the paradigm shifts towards pro-environment policies, especially regarding the transition to clean energy, the production of green technology is gaining momentum within the manufacturing sector. Government policies are increasingly encouraging companies to adopt environmentally friendly technologies, demonstrating this trend. Furthermore, several companies in Indonesia have successfully embraced green technology, reporting reductions in emissions and more efficient energy use. In simple terms, green technology refers to technologies designed to support the implementation of a sustainable development framework that balances economic surplus, ecological equilibrium, and human well-being. This aligns with the efforts of many countries to meet the targets of Sustainable Development Goal number 9, which calls for building resilient infrastructure, promoting inclusive and sustainable industrialization (sustainable manufacturing), and fostering innovation.¹

Indonesia, as one of the countries committed to using environmentally friendly energy, is also reforming its manufacturing industry to prepare for the production and distribution of green technology. One of the policies aimed at boosting local innovation in building green technology infrastructure is the implementation of local content requirements (LCR).² In simple terms, this policy mandates companies to use a certain percentage of materials or components produced domestically to protect local industries.³ This is intended to expand job opportunities and enhance the transfer of technology to domestic

¹The Global Goals. (n.d). Industry, Innovation, and Infrastructure. The Global Goals. Available at: <https://www.globalgoals.org/goals/9-industry-innovation-and-infrastructure/>.

²Aji Kakti. (2024). Menperin: SNI dan TKDN Instrumen Kunci Tumbuhkan Industri Nasional. Antara News. Available at: <https://m.antaranews.com/berita/4128705/menperin-sni-dan-tkdn-instrumen-kunci-tumbuhkan-industri-nasional>.

³Esti Hayu Dewanti. (2012). Persyaratan Kandungan Lokal (Local Content Requirements) di Indonesia dan Kaitannya dengan Perjanjian Internasional di Bidang Investasi. Yuridika Vol. 27 No. 3, pp. 203–216. Available at: <https://e-journal.unair.ac.id/YDK/article/download/300/165/467>.

industries.⁴ Thus, the concept behind this policy is designed to ensure national sovereignty in development aspects while serving as a "learning-by-doing" mechanism for local industries in green technology development.

The LCR policy mandates the development of green technology using 40–60% domestic product components, covering equipment, assembly, as well as operations and maintenance services. However, examining the current status of this policy's implementation, LCR has become an obstacle to the development of green technology in Indonesia. This can be observed in the production of components for solar power plants. The LCR requirement of 60% for solar modules has hindered investment flows and financial certainty from international financial institutions.⁵ The aggressive application of LCR tends to affect equipment standards, project costs, and the feasibility of project development in Indonesia. This phenomenon is generally due to the unpreparedness of domestic industries to produce technology with adequate capacity.⁶ Indonesia currently has only one factory capable of producing solar modules with a capacity of 560 watt-peak. In contrast, most other manufacturers can only produce modules with a capacity of 450 watt-peak. Additionally, 21 other factories are assembly companies that import solar power plant components from abroad. As a result, the cost of domestically produced components is 30-45% higher compared to importing technological supplies.⁷

⁴Ibid.

⁵Hilma Meilani. (2024). Permasalahan TKDN dalam Pengembangan PLTS. Pusat Analisis Keparlemenan Badan Keahlian Setjen DPR RI (Isu Sepekan Bidang Ekkuinbang, Komisi VII). Available at: https://berkas.dpr.go.id/pusaka/files/isu_sepekan/Isu%20Sepekan---II-PUSLIT-Januari-2024-245.pdf.

⁶Ibid.

⁷Ibid.

HOW DOES THE LCR POLICY WORK AND WHAT ARE ITS BENEFITS?

The implementation of the LCR policy is related to the infant industry argument, which explains that new industries, particularly in the context of developing countries, need protection from international suppliers until they become mature, stable, and competitive.⁸ Domestic industries are required to use components from local suppliers instead of importing them. This economic protection will be gradually lifted once domestic industries can compete internationally by demonstrating their comparative advantage and having enough capital to invest in independent research and development (R&D).

In short, the LCR policy takes into account the inferior technological capacity in developing countries. This is evident in the fact that the domestic costs of intermediate goods are often higher than international prices, which naturally pushes domestic technology producers to import.⁹ This is where the national government's consideration of the LCR policy comes into play. The policy is believed to help generate artificial demand within a country, which in turn raises the price of local components. LCR is expected to incentivize local industries to produce and innovate in response to the growing demand, leading to an increase in the supply of such technologies.¹⁰

⁸Will Kenton. (2023). Infant-Industry Theory: Definition, Main Arguments, and History. Investopedia. Available at: <https://www.investopedia.com/terms/i/infantindustry.asp>.

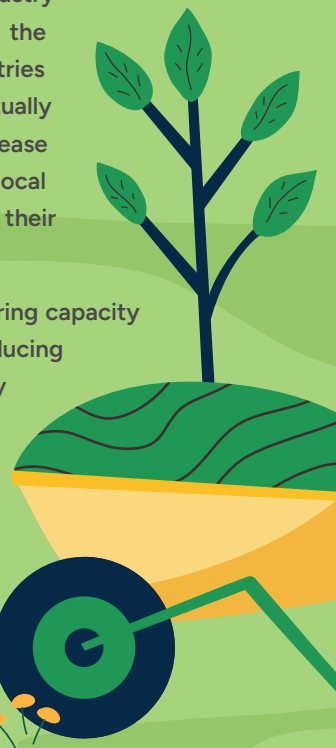
⁹Siwage Dharma Negara. (2016). The Impact of Local Content Requirements on The Indonesian Manufacturing Industry. ISEAS Yusof Ishak Institute (ISEAS Economics Working Paper No. 2016-4), pp. 1–31. Available at: <https://www.iseas.edu.sg/wp-content/uploads/pdfs/ISEASEWP2016-04Negara.pdf>.

¹⁰Ibid., hlm 2–3.



The implementation of the LCR policy is considered to generate significant benefits, particularly in the economic and environmental sectors. On the environmental side, LCR is seen as a driver for job creation, especially in the field of green jobs.¹¹ This is linked to increased political support for the government due to its efforts in intensifying green industry programs. LCR is also believed to promote the growth of the manufacturing industry. To meet the rising demand, local industries will first supply green technology on a national scale and eventually engage in exports. Additionally, LCR has the potential to increase tax revenues for the government due to the growth of the local manufacturing sector, enabling developing countries to boost their income while expanding their industrial sectors.¹²

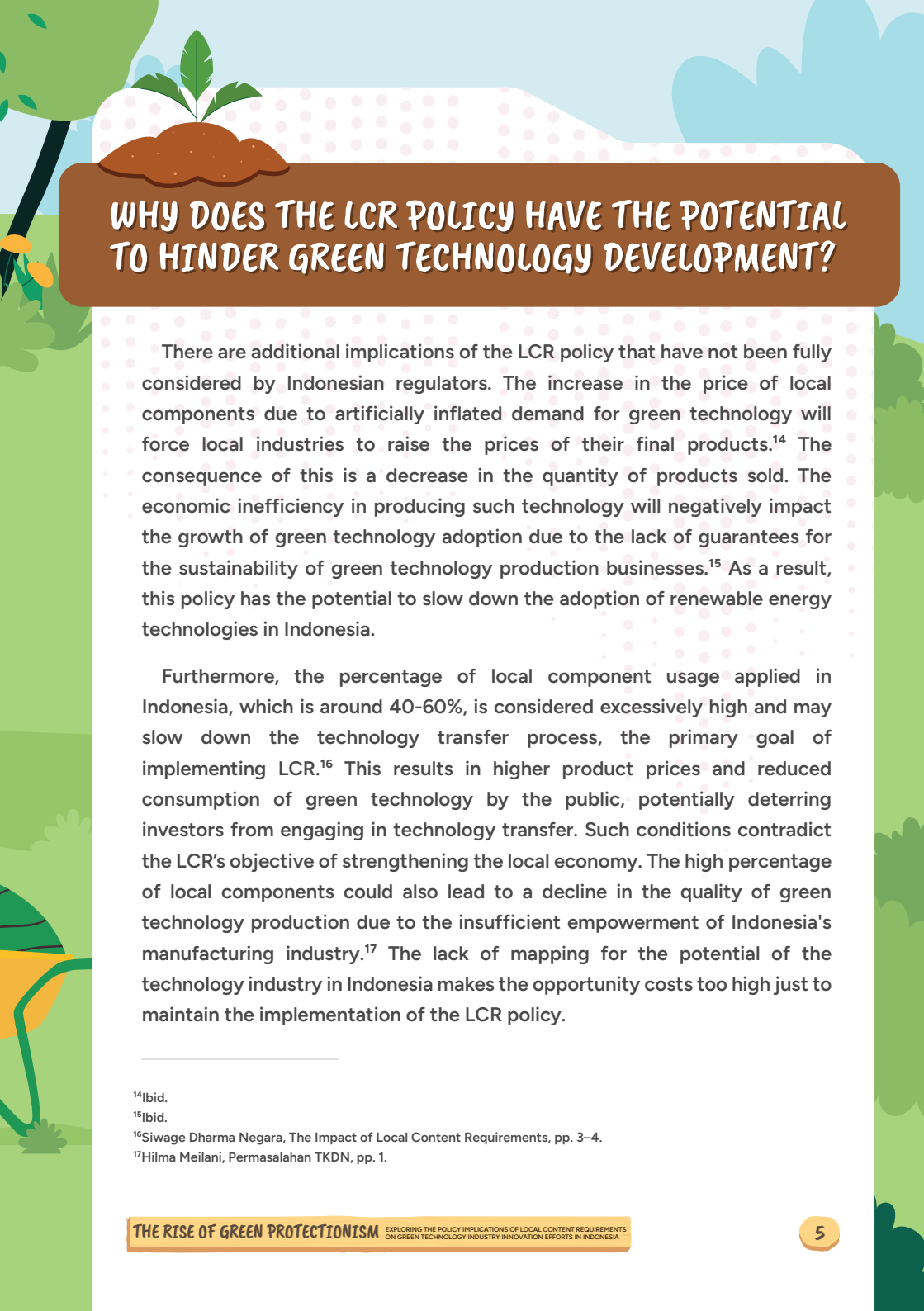
Furthermore, the gradual increase in a country's manufacturing capacity for green technology will eventually reduce the costs of producing more green technologies.¹³ This will make renewable energy technologies increasingly competitive compared to nuclear and fossil energy, without requiring heavy state subsidies. Moreover, as mentioned earlier, LCR also simplifies the process of knowledge distribution regarding green technology and its operation, a crucial component in achieving global green industry growth.



¹¹Jan Christoph Kuntze and Tim Moerenhout. (2012). Local Content Requirements and the Renewable Energy Industry - A Good Match? Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2188607.

¹²Ibid., pp 4–5.

¹³Ibid.



WHY DOES THE LCR POLICY HAVE THE POTENTIAL TO HINDER GREEN TECHNOLOGY DEVELOPMENT?

There are additional implications of the LCR policy that have not been fully considered by Indonesian regulators. The increase in the price of local components due to artificially inflated demand for green technology will force local industries to raise the prices of their final products.¹⁴ The consequence of this is a decrease in the quantity of products sold. The economic inefficiency in producing such technology will negatively impact the growth of green technology adoption due to the lack of guarantees for the sustainability of green technology production businesses.¹⁵ As a result, this policy has the potential to slow down the adoption of renewable energy technologies in Indonesia.

Furthermore, the percentage of local component usage applied in Indonesia, which is around 40-60%, is considered excessively high and may slow down the technology transfer process, the primary goal of implementing LCR.¹⁶ This results in higher product prices and reduced consumption of green technology by the public, potentially deterring investors from engaging in technology transfer. Such conditions contradict the LCR's objective of strengthening the local economy. The high percentage of local components could also lead to a decline in the quality of green technology production due to the insufficient empowerment of Indonesia's manufacturing industry.¹⁷ The lack of mapping for the potential of the technology industry in Indonesia makes the opportunity costs too high just to maintain the implementation of the LCR policy.

¹⁴Ibid.

¹⁵Ibid.

¹⁶Siwage Dharma Negara, *The Impact of Local Content Requirements*, pp. 3–4.

¹⁷Hilma Meilani, *Permasalahan TKDN*, pp. 1.

Figure 1. Illustration of the Suitability of Implementing LCR to Maximize Welfare Benefits



Source: "Local Content Requirements and the Renewable Energy Industry - A Good Match?" by Jan-Christoph Kuntze and Tom Moerenhout (p. 26)

Veloso (in Kuntze and Moerenhout, 2013) explains that the implementation of LCR can be effective if the government does not set excessively high proportions of required domestic components.¹⁸ The appropriate percentage needs to be determined by considering the production capacity that local industries can handle in the market, as well as the capital available for producing green technology. Proper consideration of this percentage will attract foreign investors to invest in Indonesia, even with the limited resources of the local industry. Moreover, an important aspect to measure the effectiveness of LCR on the green technology industry is the assessment of welfare loss and welfare benefits. The primary consideration and paradigm for implementing LCR should be the creation of national welfare, rather than solely focusing on products that can compete on a global scale.¹⁹

¹⁸Hilma Meilani, Permasalahan TKDN dalam Pengembangan PLTS.

¹⁹Jan Christoph Kuntze and Tim Moerenhout, Local Content Requirements, pp. 26.



WHY DOES LCR NOT INSTANTLY IMPROVE THE QUALITY OF LOCAL MANUFACTURING INDUSTRIES?

Examples of LCR policy implementation in Brazil, India, and South Africa show that this policy does not automatically create a self-sufficient and competitive local manufacturing sector. Several factors contribute to this.²⁰

First, local companies tend to focus on producing simpler components with lower added value, such as turbine blades and casings, rather than more complex components like nacelles. This indicates that, despite the existence of LCR, the development of more advanced manufacturing capacities remains relatively limited.

Second, LCR policies often lead to increased project costs. In Brazil, for example, even though there was an increase in production capacity for certain components, many projects faced delays due to dependency on imported components, resulting in production delays and additional costs. Uncertainty regarding demand and government policies also creates an unstable environment for the sustainable development of the manufacturing industry.

²⁰Morgan Bazilian, Victoria Cuming, and Thomas Kenyon. (2020). Local-content rules for renewables projects don't always work. *Energy Strategy Reviews* Vol. 32, pp. 1–10. Doi: <https://doi.org/10.1016/j.esr.2020.100569>.



Third, decisions made by international institutions can also influence the implementation of LCR policies. For example, the World Trade Organization (WTO) ruled against India, stating that local content requirements for solar products violated international trade rules. This highlights how external factors can affect the effectiveness of such policies. When a policy is deemed to violate international trade regulations, the government may need to eliminate certain local requirements, reducing incentives for companies to invest in enhancing local production capacity.

Fourth, the role of financing institutions, such as the Brazilian Development Bank (BNDES) in Brazil, illustrates that even with incentives for using local components, reliance on local financing can become a challenge during economic downturns. Therefore, to create a self-sufficient and competitive local manufacturing sector, it is essential to design LCR policies that consider market stability, the development of higher capacities, and effective collaboration with the private sector.

HOW OTHER COUNTRIES IMPLEMENT LCR POLICIES AND HOW INDONESIA CAN REPLICATE THEIR SUCCESS

China's Local Content Requirement (LCR) policy has become a successful model for many countries seeking to grow their green technology industries through domestic industry protection. China's success in establishing a globally competitive wind turbine industry through LCR demonstrates that protectionist policies can work effectively when implemented strategically and supported by complementary policies. Indonesia can learn from China's success by adapting key elements of their policy.

One of the main factors behind the success of LCR in China is the presence of a large and stable domestic market.²¹ China has significant wind energy potential, estimated between 700 to 1200 GW, creating a high domestic demand for wind turbine products. The strong demand for green technology in the local market is also supported by a high level of public acceptance regarding renewable energy.²² The Chinese population is relatively aware of the positive environmental impacts of using renewable energy. Furthermore, a stable market condition provides local industries with assurance of sufficient demand to absorb their production, allowing for increased production scale. Indonesia needs to consider market volume, as despite having substantial renewable energy potential, its domestic market and public acceptance of renewable energy are not yet fully developed. This could pose challenges in implementing LCR policies. By creating stable demand through consistent clean energy policies, Indonesia can ensure its domestic green technology industry has

²¹ Jan Christoph Kuntze and Tim Moerenhout, Local Content Requirements, pp. 10–15.

²² Madad Ali, et.al. (2023). Modeling Public Acceptance of Renewable Energy Deployment: A Pathway Towards Green Revolution. Economic Research Vol. 36, pp. 11-19. doi.: <https://doi.org/10.1080/1331677X.2022.2159849>.



The implementation of LCR in China was carried out gradually, allowing local industries to learn over time and adapt to technological advancements.²³ The LCR policy in the wind energy sector started with a local content requirement of 20% in 1997 and gradually increased to 70% by 2004. This phased approach provided local industries with time to develop and adjust to new technologies without facing excessive pressure.

In Indonesia, the current LCR policy mandates the use of local components at up to 60%, which is often considered too high and can hinder the development of green technology. By temporarily lowering the local content percentage and then gradually increasing it as local industry capacity and production quality grow, Indonesia could create a more flexible environment for industries to develop and compete in international markets. This strategy would allow local manufacturers to build their capabilities progressively while ensuring that they remain competitive and sustainable in the long run.

The success of LCR in China is also supported by substantial financial incentives from the government. China not only established strict LCR requirements but also provided subsidies and favorable electricity tariff incentives for companies that comply with these policies. Additionally, China leveraged the Clean Development Mechanism (CDM) scheme to facilitate technology transfer through partnerships with foreign companies. In Indonesia, the effectiveness of the LCR policy would be enhanced with adequate financial incentives. The government should offer subsidies or tax incentives to companies adhering to LCR, while ensuring that these policies do not undermine the competitiveness of local products in international markets.

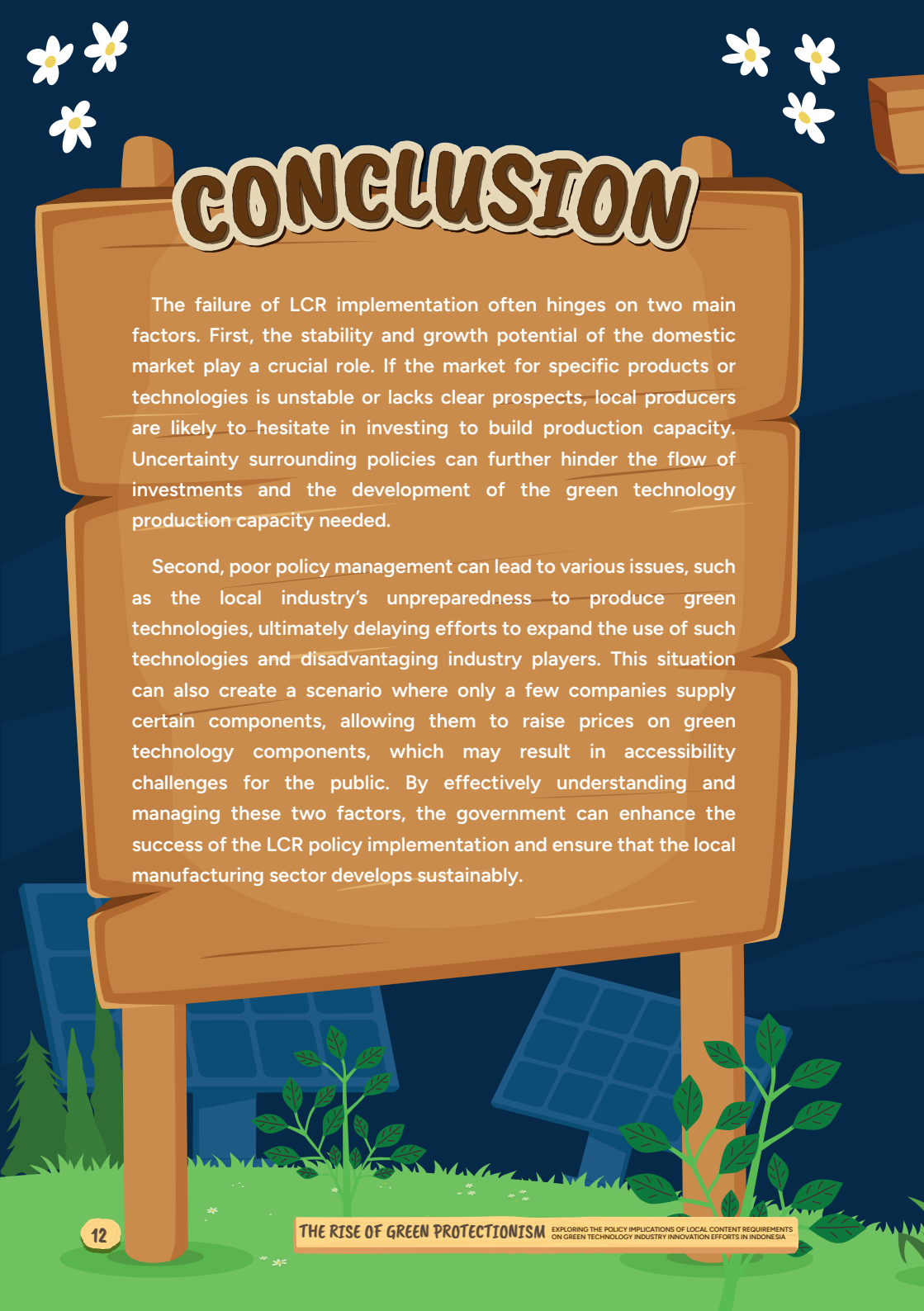
²³Jan Christoph Kuntze and Tim Moerenhout, Local Content Requirements, pp. 10–15.

Furthermore, China's LCR policy has successfully created a significant number of jobs. It is estimated that this policy has generated around 150,000 direct jobs in the wind energy sector and a total of 200,000 jobs across the supply chain. This job growth, particularly in the green sector, has bolstered political support and public acceptance of clean energy policies in China. Indonesia can leverage the TKDN policy to create jobs in the green technology sector, but this can only be achieved if local industries are encouraged to innovate and invest in research and development (R&D), thereby enhancing their capacity to produce competitive green technologies.

Technology transfer is a key element in the success of LCR in China.²⁴ Through partnerships with foreign companies, such as Gamesa from Spain, China has achieved significant technology transfer, enabling domestic firms to learn and develop advanced technologies quickly. Indonesia should encourage similar collaborations with foreign green technology companies to accelerate technology transfer and strengthen the capacity of local industries.

The success of China's LCR policy offers many lessons for Indonesia. By adopting a phased approach to LCR implementation, strengthening financial incentives, creating stable domestic demand, and promoting technology transfer, Indonesia can maximize the potential of the TKDN policy to accelerate the growth of the green technology industry and achieve sustainable development goals.

²⁴Ibid.



CONCLUSION

The failure of LCR implementation often hinges on two main factors. First, the stability and growth potential of the domestic market play a crucial role. If the market for specific products or technologies is unstable or lacks clear prospects, local producers are likely to hesitate in investing to build production capacity. Uncertainty surrounding policies can further hinder the flow of investments and the development of the green technology production capacity needed.

Second, poor policy management can lead to various issues, such as the local industry's unpreparedness to produce green technologies, ultimately delaying efforts to expand the use of such technologies and disadvantaging industry players. This situation can also create a scenario where only a few companies supply certain components, allowing them to raise prices on green technology components, which may result in accessibility challenges for the public. By effectively understanding and managing these two factors, the government can enhance the success of the LCR policy implementation and ensure that the local manufacturing sector develops sustainably.

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