VIEW POINT

HOW THE STRATEGIC PIVOT TO ONSHORE VALUE ADDITION BY RESOURCE-RICH NATIONS IS CREATING A NEW WORLD ORDER

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Abstract

In the face of intensifying global disruptions, resilience emerges as a key enabler for a more sustainable, low-carbon future. Amidst the transformative paradigm shift, resource-rich regions like Australia, Chile, African Union, Canada, and China are reimagining their economic landscapes. Defined by the imperatives of decarbonization and clean technology, as well as fears of a looming recession, they are recognizing the need to re-evaluate their roles in global demand and supply. Identified by their wealth of natural resources, specifically iron ore, metallurgical coal, and other essential minerals and base metals, these countries are emerging as the new pillars of global growth in urbanization and industrialization.

As chief suppliers of critical raw materials, these resource-rich geographies are seeking to secure a substantial share in the value-addition process through onshore processing, local job creation, and higher gross domestic product (GDP). Further, they are looking toward technological advancements and industrial diversification of their existing upstream-only local economies, solidifying their position in the value chain. Beyond their reliance on raw material exports, they are pursuing a strategic balance with greater downstream processing, in alignment with the United Nations Sustainable Development Goals (UNSDGs).

This perspective outlines the comprehensive journey toward the shift within geologically wealthy nations. It highlights the various dimensions to the evolving new world order, moving away from traditional resource exports and toward a wealthier, greener, and more socially sustainable world.

Background

In July 2002 , BHP Billiton initiated a historic move when it legally demerged its steelmaking wing into BHP Steel[1] , which subsequently evolved into Bluescope Steel, Australia. The strategic division was an attempt at rebalancing their asset portfolio, focusing on long-life upstream assets in minerals and petroleum, while moving away from higher value industrial downstream operations. This meant they prioritized raw material exports while reducing their involvement in onshore steel production that was being offered more competitively at lower production costs and higher productivity in the destination markets for the ore, particularly Japan, China, and South Korea.

This restructuring exercise became a template adopted by many industries operating within resource-rich regions. The wealth of natural resources in these geographies fostered the belief that resource extraction would remain more profitable than investing in downstream processing as it competed against low-cost alternatives offered by developing nations. This led to a substantial transformation in job creation and value addition. However, it also resulted in an unexpected decline in government revenues of resource-rich developed nations, with job stagnation and irrecoverable losses, driving an increase in total factor productivity (TFP), evolution of state-level industrial work-ethics, deeper industrialization, and greater urbanization.

The new template also stimulated a demand for raw commodities, serving as an incentive for resources players to turn their focus on extraction for export. This in turn resulted in the acceleration of industrialization and urbanization, as well as sustainable job growth in emerging economies like China and parts of Southeast Asia. These regions then emerged as the new hubs of economic growth driven by manufacturing and value addition, even as resource-rich countries plateaued on these markers.

This transition, in essence, signified a shift toward prioritizing the export of raw resources over a more holistic forward-integrated value chain approach. It signaled a departure from manufacturing, industrial self-sufficiency, and value addition at every stage except extraction. Neglecting investments in processing and manufacturing, this move significantly restricted value creation within the resource-abundant economies.

The Paradigm Shift

Amid the present-day challenges from geopolitical shifts in power and climate concerns, resource-wealthy countries now acknowledge the need for a shift in their economic paradigm and a strategic ascent up the value chain. Beyond their historic role as exporters of raw materials, these regions are now on a drive to increase their involvement in downstream processing.

As the dust settles on the current wave of geopolitical tensions and the world moves into a new super-cycle of growth investments in infrastructure – from Ukraine and the expansive New Silk Road[2] to the investment-hungry ASEAN region (particularly Indonesia and Vietnam), and from the rapidly growing Indian economy to the African Union – resource-rich countries aim to claim a significant portion of the revenue generated through downstream onshore processing. In this viewpoint, we explore how the new world order is unfolding and what is expected on the road ahead, as more countries invest in onshore value-addition strategies.

From Extraction to Forward Integration

Today, the traditional model of exporting raw commodities is giving way to a comprehensive approach that covers the entire value chain. Forward integration is at the heart of this transition, a strategy where companies domestically control downstream supply chain operations, including production, distribution, and sales[3]. This means, along with extracting and exporting raw materials, resource-rich regions are integrating and investing in processing and manufacturing capabilities as well. With the raw materials converted into finished products, such as iron ore and coking coal processed into steel, or lithium, nickel, and cobalt into batteries for electric vehicles (EVs), these regions are starting to capture a larger share of the value created. They are also demonstrating better control over their industrial processes and their future.

More than 80% of lithium and 50%[4] of copper is now produced in Australia, Chile, Peru, and China. ASEAN cumulatively contributes to over 25%[5] of both smelted nickel and tin, capturing a globally significant share of processing, refining, and onshore value addition. Indonesia, the world's largest producer of nickel, as well as a plethora of other minerals and metals, has managed to scale up its processing and production with a 530% increase in nickel and a huge 5400% in bauxite[4]. Its ambitious strategy: to take on a key role in global supply chain activities for EV battery production through onshore value addition[5].

The finished products in forward integration – popularly termed the "tightly coordinated supply chain[7]" – have great economic value, wide application, and a high potential for going green end-to-end. Forward integration reduces reliance on external markets and enhances value in global trade. A World Bank report on the drivers of participation[8] classifies the shift toward forward-integrated value addition as a strategic move to diversify economies through abundant natural resources and technical know-how, promoting sustainable development aligned with the UNSDGs.

With resource-rich countries leading the way, several development initiatives the world over are focused on accelerating the transition to this integrative approach. An example is that of Lithium Australia, a champion of forward integration and the circular battery economy. Its strategy covers the complete cycle of integration from mineral extraction and refinement to manufacture and eventual recycling[9]. Another relevant example is Australia's richest person, Ms Gina Rinehart's foray into Lithium with her acquisition of significant stakes in Liontown Resources and Azure Minerals, both of which are now working with the Korean industrial major, Posco, to plan for onshore Lithium Cathode manufacturing in Western Australia.

Local Job Creation and Greater Share of Value

Embracing forward-integrated value addition enables better job opportunities with long-term competitiveness. From mining and processing to more sustainable Total Factor Productivity (TFP) increasing jobs in manufacturing and distribution, the possibilities for long-term wealth-building local employment increase manifold. Localized job creation becomes essential for regions that aim to diversify their economies and reduce resource export dependencies. The World Economic Forum's Future of Jobs report for 2023[10] states that localization of all processes on the entire supply value chain will lead to net job growth, while the increased use of technology will offset losses.

Beyond diversifying domestic economies, forward integration can help foster labor market stability. Consider China, the world's biggest steel maker[11], and India, close on its heels, both rich in iron ore and minerals. These countries are set to double steel production by 2030[12], resulting in a substantial increase in their mining and manufacturing workforces. Australia is diversifying and investing in onshore raw material processing. It is also making great strides in energy storage system manufacturing and integration and is expected to significantly reduce carbon emissions. With diversification and forward integration, this 'lucky country' is expected to see an increase in its workforce by 34,700 by 2030, a remarkable 478%[13] boost compared to battery raw material mining jobs recorded in 2020.

Evidently, local job creation is a cornerstone of the forward-integrated transition. However, the transition to onshore value addition is not only about creating local jobs but also capturing a large share of the generated income. Resource-rich nations can move up the value chain and derive greater benefits from their raw materials. Instead of focusing only on exports, they can invest in finished and near-finished product manufacturing, generating more revenue. The United Nations Conference on Trade and Development (UNCTAD) report of 2021[14] upholds the view that this can also help enhance economic resilience in the face of volatile commodity markets.

Technological Advancement: The Catalyst for Change

Innovative technologies can accelerate onshore value addition by helping optimize production processes, product quality, and sustainability in operations. Forward integration calls for skill sets across the value chain—an investment that comes at a cost. While forward integration could insulate resource-rich nations from supply chain disruptions, critical processes could sometimes be impacted by unforeseen problems or a lack of technical know-how. In such cases, sustained investments in advanced technologies can help capture growth and drive efficiencies. Technology can also achieve efficiencies and create new revenue models[15] , resulting in a demonstrable increase in productivity and performance.

Within the gamut of forward integration and onshore value addition, time, cost, and efficiency are critical factors. Technology helps address these factors, and plays a crucial role in streamlining operations and collaboration across various stages of onshore value addition. Advanced communication platforms and data-driven insights can help forecast demand, optimize supply chain management, expedite real-time decisioning, and reduce production costs. Automation and digitalization can speed up processes while ensuring high-quality output.

Clean, low-carbon solutions offer an immense opportunity in reshaping resource-rich economies, with annual global investments in climate-intelligent technology having already crossed US$ 1 trillion[13]. World Bank research[16] reveals an increasing adoption of artificial intelligence (AI), industrial automation, data analytics, information exchange, advanced robotics, and the Internet of Things (IoT) across the global value chain (GVC). These technologies are helping reduce costs, accelerate processes, enable economies of scale, enhance production quality, boost productivity, save energy, and reduce emissions. Resource-driven countries such as China, the US, South Korea, Japan, and India, and several others from the European Union, have been investing in research and development (R&D)[17] in attempts to better support onshore value addition.

Sustainability and Environmental Stewardship

Mining and processing critical minerals and raw materials is usually an energy-intensive process with high carbon emissions. It can also use up enormous volumes of water, while generating huge amounts of hazardous waste. Resource-driven regions face mounting pressures to address these environmental, climate-related, and social concerns.

The shift to forward integration is witnessing a strong trend toward greening the entire value chain, including co-locating[18] refineries and production plants with renewable power sources. For example, Vulcan Energy's lithium direct extraction and refinery in Germany is slated to use its own geothermal energy to power operations[19]. Labeled the zero-carbon lithium project, it will generate more green energy than the operations require. Another example is Infinity Lithium's San Jose project in Spain[20]. The brownfield project proposes to use renewable power sources, including green hydrogen, for the refinery's end-to-end operations, from sourcing and transporting the raw materials to treating toxic waste at the end of each production cycle.

Forward-integrated value additions, therefore, offer resource-rich nations the opportunity to demonstrate environmental stewardship through sustainable extraction and production, significantly reducing greenhouse gas emissions (GHGs)[21]. In driving the sustainability transition, these regions can assess and adopt clean technologies that strike a balance between risk, capital, and quality.

Geopolitical Implications and Challenges

As resource-rich nations move up the value chain, they exercise greater autonomy and exert more influence over global trade dynamics. Equipped with the ability to offer finished products, will give them a commanding position in trade negotiations and shaping international trade norms. This shift in global positioning can recalibrate existing geopolitical relationships, alter power dynamics, and restructure economic alliances[22]. Therefore, the focus of these countries must be on long-term strategic and geopolitical alignment. They must define clear policies and trade parameters with an eye on the greater good of the global community.

Research on the geopolitics of green resource champions[23], such as Australia, Canada, Namibia, and the US, shows that integrating critical insights from the value chain perspective can help calm geopolitical anxieties, especially considering that mineral processing and production are concentrated among the bigger producer countries[6]. With trade patterns varying enormously even between the dominant countries, trade considerations must include long-term implications of availability and demand. This will help reorganize, adjust, and balance both economic and environmental factors.

Besides balanced international diplomacy, there are other benefits from forward-integrated value-addition. A skilled workforce, essential infrastructure, as well as adequate investments in technology and processes require sustained efforts. In the case of relatively smaller players, downstream processing may have to wait for cheap and adequate capital raising or until production has reached required levels of scale. This may, sometimes, be challenging to realize. At other times, there may not be enough raw materials to make it cost-effective[24]. Therefore, balancing resource extraction with value addition in already wealthy resource-rich regions is crucial.

Collaborative Strategies for a Sustainable Future

While dealing with the challenges and geopolitical implications, it is also important that the resource-dominant nations engage in collaborative partnerships to ensure the success of forward integration efforts. Partnering on the transformative journey can facilitate knowledge transfer, technology exchange, market access, an accelerated pace, and amplified global impact. Additionally, the concept of GVCs can help create a new world order that will generate greater value, achieve cost efficiencies, and optimize extraction and production processes[25]. International collaborations over trade are a key factor in seeking globally beneficial partnerships. Policies around partnerships must not be about maximizing export revenue but meeting the needs of the economy and environment.

Conclusion: A Greener World Order

In their quest for resilience, resource-rich nations are navigating a transformation journey toward improved global economic balance. By embracing the entire value chain from extraction to forward integration, these countries are helping create the blueprint for a sustainable future. This strategic shift brings with it job creation, knowledge distribution, and sustainable growth driven by technological innovation. Together, these nations can help shape a new green world order influencing global trade dynamics and redefining geopolitical relationships through collaborative initiatives. As we move closer to mid-century climate goals, forward integration is not merely a paradigm shift among the resource-driven but also the pathway to creating a more resilient, greener planet.

References

1. BHP | BHP Steel Demerger Effective Following Court Approval
2. World Economic Forum | China's $900 billion New Silk Road. What you need to know
3. Inbound Logistics | Vertical Integration: Definition, Examples, and Advantages
4. MDPI resources | Modelling the Make Process of the Mineral Supply Chain Upstream Segment
5. Intergovernmental Forum on Mining, Minerals, Metals, and Sustainable Development | ASEAN-IGF Minerals Cooperation: Scoping study on critical minerals supply chains in ASEAN
6. tni.org | Between a mineral and a hard place: Indonesia's export ban on raw minerals
7. The Economist | Vertical integration
8. World Bank Group | eLibrary | World Development Report 2020: Trading for Development in the Age of Global Value Chains | Drivers of Participation
9. Lek.com | Why are Battery Companies Investing in Mines? — Strategies for Vertical Integration in the Mining Industry
10. World Economic Forum | The Future of Jobs Report 2023
11. Financial Review | Shift to green steel challenges future of Australian iron ore
12. Financial Review | This global steel boss says Australia is not investing enough in coal
13. Climate Energy Finance | A Critical Minerals Value-Adding Superpower
14. United Nations Conference on Trade and Development | Fifteenth session | From inequality and vulnerability to prosperity for all
15. McKinsey & Company | Five strategies to transform the oil and gas supply chain
16. World Bank Group | Global Value Chain Development Report 2019 | Technological Innovation, Supply Chain Trade, and Workers in a Globalized World
17. McKinsey Global Institute | Reverse the curse: Maximizing the potential of resource-driven economies
18. Herbert Smith Freehills | Financing the Energy Transition - Critical Minerals Processing
19. The Australian Business Review | When zero is hero: Why Vulcan's Zero Carbon Lithium project is ahead of the pack
20. NS Energy | San Jose Lithium Project
21. RMI.org | Technology Disruption in the Global Steel Industry
22. International Renewable Energy Agency | Geopolitics of the Energy Transition - Critical Materials
23. Energy Research & Social Science | Green hydrogen value chains in the industrial sector—Geopolitical and market implications
24. Oxford Academic | 25 Downstream Activities: The Possibilities and the Realities
25. OECD.org | A first look at the steel industry in the context of global value chains

Author:

Nishant Kumar
Associate Vice President
Global Energy and Resources, Infosys

For more information, contact askus@infosys.com

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