Centre For A New South Asia

India-Nepal Seminar Vision Paper

The Centre For A New South Asia (CNSA) is a Research Centre at the Jindal School of International Affairs within the esteemed O.P. Jindal Global University in Sonipat, India. Our primary objective is to examine the geopolitical dynamics within South Asia and on a global scale, intending to address and mitigate challenges prevalent across the Asian region and beyond.

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Hydro–powering the Future of Nepal, India, and the Region

Vision Paper on Nepal–India Relations

Abstract

South Asia is one of the world's least integrated regions, with limited economic cooperation and frequent political conflict. Attempts at regional cooperation from the 'top-down' using institutions such as SAARC and BIMSTEC have not seen much success. A 'bottom-up' sector-specific approach could better promote economic development and political stabilisation. This paper will explore the potential for hydropower to be a cornerstone for Nepal–India economic relations and promote regional integration in South Asia.

As India's economy and population grow, so too will its energy needs. At the same time, Nepal needs to secure export markets to facilitate greater utilisation of its significant renewable energy potential. A strategic hydropower partnership between Nepal and India is in the interest of both countries and could serve as a model for greater economic integration in the region. This paper takes lessons from i) Australia's energy trade with Japan, ii) the European Coal and Steel Community and iii) the Southern African Power Pool to propose a vision for integration in South Asia that could overcome existing challenges and realise the untapped potential of regional energy cooperation.

Keywords: Nepal–India, energy, hydropower, South Asia, regional integration

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Introduction

It's the 1940s, and the region is in turmoil. Political instability has turned into violence, leaving millions displaced as boundaries are redrawn. In this atmosphere of animosity, the region seems doomed to stay fractured forever.

Yet today, Germany, France and Italy, once perennial enemies, are now united under the European Union — one of the world's most prosperous and integrated zones. The case of Europe has lessons for South Asia and Nepal–India relations, demonstrating that economic connectivity can bring political stability and prosperity.

Nepal and India have a complicated relationship, with areas of strength and areas of tension. Bilateral ties go back to the 1950 Treaty of Peace and Friendship and 1954 Treaty of Trade and Transit, which enabled free movement between citizens and laid the foundation for the strategic and economic relationship. But there are also political and diplomatic challenges, such as border disputes in Kalapani and Lipulekh and India's stance towards Nepal. The economic relationship is heavily tilted towards India: two-way trade of US$9.6 billion in 2022 comprised of US$8.66 billion in Indian exports and US$956 million of Nepali exports (Vashisht, 2024; OEC, 2022).

This paper examines the potential and challenges for hydropower trade between India and Nepal; the prospects for regional energy integration; and takes lessons from other regions to set out a vision for Nepal–India relations in a new South Asia.

Due to limitations in time, length and the authors' knowledge, we give only a cursory examination of technical and political considerations. Yet this constraint has benefits; unburdened by geopolitics, we put forth a vision that may seem as idealistic as the concept of a 'European Union' would have been during the Second World War.

Hydropower

The fundamentals

Hydropower can be the pillar of Nepal–India relations because of i) India's power needs, ii) the shift towards clean energy and iii) the potential of Nepal's generating capacity.

Already the world's largest population and fifth-largest economy, India's growth will result in sustained increases in its power demand. India's consumption peaked at 250GW (250,000MW) on May 30 this year, and demand is projected to surpass 400GW by 2031-2032 (Economic Times, 2024a). India's current energy mix is heavily reliant on coal (Figure 1), which will need to change as it decarbonises.

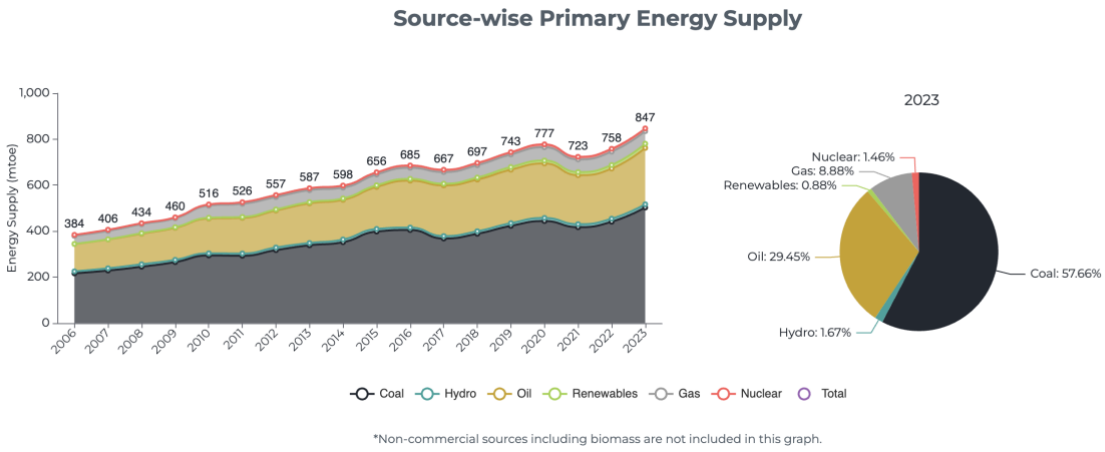

Figure 1. India's energy mix (NITI Aayog, 2023)

The Indian government has acknowledged the clean energy imperative and plans to derive 50 per cent of its electricity from renewables by 2030 and reach net-zero emissions by 2070 (Kathmandu Post, 2023a). Any energy source that will form part of India's future mix (such as solar, wind or hydropower) must be consistent, cheap and clean. We propose a fourth 'C': 'cooperative'. Focusing on an energy source that is derived from a neighbour and can be shared amongst the region could create an impetus for greater cooperation and economic integration, generating a 'political stability externality' through trust and interdependence.

We use hydropower as a case study for energy-based regional integration because Nepal–India trade in hydropower already exists and because we seek to emphasise South Asian cooperation. Focusing on solar, for example, would bring China into play given it is the world leader in solar panels and batteries.

Nepal's 6,000 rivers provide it with significant hydropower resources, with total theoretical generation estimated at 72,000–83,000MW and an economically feasible potential of 43,000MW (Kathmandu Post, 2023b; Asian Development Bank, 2020a). India's total capacity is estimated at about 145,000MW with a feasible potential of 84,000MW — despite being 22-times larger, it has only twice the capacity (Asian Development Bank, 2007). Moreover, India's prime hydropower sources are blocked by tribal land claims and interstate disputes, which means tapping this source of energy will be complicated. Trade with Nepal is a better path for Indian hydropower consumption.

Nepal has an installed electricity capacity of 3,157MW, comprising of hydropower (2,991MW), solar (107MW), thermal (53MW) and co-generation (6MW) (Kathmandu Post, 2024; Ministry of Energy, Water Resources and Irrigation, 2018). Its hydropower comes from 124 operating plants, with a further 235 under construction which will create a total generating capacity of 8,667MW (Reuters, 2023). Domestic demand is currently about 1,700MW but is expected to rapidly grow to 13,500MW by 2035 (Kathmandu Post, 2023c).

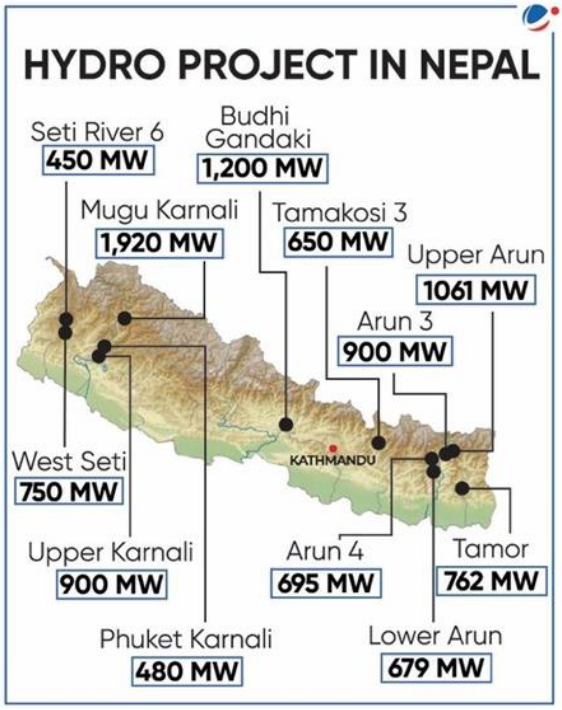

Figure 2. Nepal's hydropower projects (Vision IAS, 2024)

The government has a 12-year plan to generate 28,000MW of electricity by 2035, of which 10,000MW is planned for export to India, 5,000MW to Bangladesh, and 12,000MW earmarked for domestic consumption (Business Standard, 2024a). Analysis from the Asian

Development Bank estimates that realising 20 per cent of Nepal's economically viable hydropower potential (8,000MW) would lift GDP 87 per cent above the baseline (Asian Development Bank, 2020a).

Why trade?

Nepal has become a net exporter of hydropower, sending NPR17.07 billion of electricity to India in 2023-24 (Kathmandu Post, 2024). This was earned from about 700MW of exports — officials estimate that increasing exports to 1,000MW would lift revenues to about NPR27 billion. But Nepal is also an importer, purchasing NPR16.93 billion of electricity from India. Most domestic plants are based on a run-of-the-river system, which means that Nepal generally exports to India in the wet season and imports power during the dry season (Business Standard, 2024b; Economic Times, 2024b).

Hydropower could be a significant source of revenue and a driver of economic development for Nepal by attracting investment and creating jobs. On average, projects lead to 40km of new local roads and employ between 100,000–300,000 workers for a period of up to five years (National Bureau of Asian Research, 2022). Increasing hydropower generation is also an essential step for Nepal to meet its Nationally-Determined Contribution under the Paris Agreement (Government of Nepal, 2020). The domestic market is too small to generate the scale necessary to effectively harness hydropower — access to India will be critical. If fully harnessed, electricity exports could generate INR310 billion in 2030 and INR1,069 billion in 2045 (IRADe, 2016).

India's interest is in importing hydropower to diversify its energy mix, reduce carbon emissions and secure a reliable source of energy for its growth ambitions. A hydropower partnership also offers a 'stability externality' by serving as a model for regional cooperation in South Asia, potentially paving the way for cooperation in trade, water management and infrastructure development.

The April 2022 India–Nepal Joint Vision Statement on Power Sector Cooperation shows that both parties are aware of the 'unprecedented opportunities' from 'mutually beneficial bilateral cooperation in the power sector' (Ministry of External Affairs, 2022). The two sides reached an agreement for the sale of 10,000MW of power from Nepal to India over the next 10 years; sales have already reached 1,000MW in the first year (The Hindu, 2024a). There has also been an agreement for Nepal to sell 40MW of power to Bangladesh through Indian

transmission lines — the first time Nepal will sell power to a country other than India (Deccan Herald, 2024). This is a critical first step to regional integration.

Challenges

But hydropower has some key challenges, both in generation and transmission. Hydropower projects require significant investment in infrastructure such as dams, transmission lines and roads. This is difficult in Nepal due to the mountainous terrain and lack of existing infrastructure, making projects expensive and time-consuming. A key focus should be on building Nepal's ability to map its resource endowments using Geographic Information System (GIS) technology. India could offer technical assistance, given its existing capacity in natural resource accounting (The Hindu, 2021).

Institutional and logistical constraints, a lack of human capital and limited access to credit has resulted in low investment in Nepal (SAWTEE, 2011). Leveraging foreign capital will be necessary to build the supporting infrastructure for hydropower generation. India can provide some of this finance, but there will also need to be greater mobilisation of regional and global capital — particularly targeted at green energy.

Once the power is generated, distributing it requires building a regional energy grid. Analysis suggests this is technically and economically feasible but requires alignment of energy policies across countries (UNESCAP, 2018a). The main problems are acquisition and a lack of financing, which means India will need to play a significant role as a regional public goods provider (Economist, 2023; Mint, 2022).

There are political obstacles, too. India refuses to buy power from plants owned by China or built by Chinese construction firms (Institute of South Asian Studies, 2024). This effectively binds Nepal to Indian investment if it wants to export hydropower, potentially leading to a bad equilibrium of underinvestment in infrastructure. This is not to suggest that greater investment from China is necessarily in Nepal's interest. Water is a critical geopolitical resource and there are important sensitivities. As an upper riparian country, China sees the use of rivers as an issue of territorial sovereignty, while India and Nepal have a common interest in emphasising territorial integrity by advocating for an equitable distribution of water resources (Sinha, 2018). But the best way to encourage cooperation is not to force Nepal's hand — India should instead support Nepal's sovereign agency by offering a better

alternative to Chinese investment.

There are also difficulties in dividing benefits. The 1996 Mahakali Treaty proposed the Pancheshwar Multipurpose Project, which would generate around 6,840MW of energy (Ministry of Jal Shakti, 2024). But negotiations have stalled due to disagreements about the distribution of power and irrigation benefits, leading to no construction yet taking place (The Hindu, 2024b). India should ensure that Nepal is included in all regional water treaties that could affect it and that benefits from existing projects flow down to the grassroots level. This will help to bridge the trust deficit and sustain the political will for cooperation.

Regional integration

The state of South Asia

Regional economic integration in South Asia has taken various forms, none of which have been particularly successful. SAARC, established in 1985, led to the South Asian Free-Trade Agreement in 2004 (UNESCAP, 2018b) but has stagnated because of political tensions, especially between India and Pakistan. Yet BBIN and BIMSTEC, which take out Pakistan as a spoiler, have done little to boost intra-regional trade (Pal, 2023).

Intra-SAARC trade accounts for about 5 per cent of the region's total trade, much lower than other regions such as Southeast Asia where intra-regional trade constitutes 23 per cent of total trade (Economist, 2024). UNESCAP estimates South Asia's intra-regional trade at about one-third of its potential (Figure 3).

Table 4: Unexploited Trade Potential in South Asia

(2014, in millions of US$)

Reporter	Actual Exports to SAARC countries	Potential Exports	Unexploited Potential	Unexploited Potential (%)	Potential Exports 2020
Afghanistan	398.13	2397.44	1999.30	83.39	4609.35
Bangladesh	532.70	7735.21	7202.51	93.11	24651.03
Bhutan	521.70	573.36	51.67	9.01	732.11
India	20486.20	41151.71	20647.34	50.17	81908.46
Maldives	13.61	110.16	96.56	87.65	332.07
Nepal	569.65	2390.08	1820.42	76.17	6386.69
Pakistan	3403.73	24479.83	21157.31	86.43	47466.82
Sri Lanka	880.96	2326.64	1445.68	62.14	6476.40
South Asia	26806.67	81164.43	54420.78	67.05	172562.92

Source: UNESCAP computations and projections based on UNESCAP Gravity Model for South Asia. See Annexure for details.

Figure 3. South Asia's trade is far below its potential (UNESCAP, 2018b)

Trade costs are high due to poor trade infrastructure and limited connectivity. Though tariffs have been reduced through SAFTA, countries still maintain long lists of protected products and impose high non-tariff barriers. Bilateral trade costs within South Asia averaged 114 per cent of the value of goods traded — meaning that it is cheaper for exporters in South Asia to trade with the United States (where trade costs average 109 per cent) than with their neighbours (UNESCAP, 2018b).

Other problems include a lack of political will and a broader trust deficit due to the

significant size asymmetry between India and the rest of the region, which makes it difficult to build a consensus for action (CUTS, 2023). India has not done enough to compensate for the power imbalance. Despite making up 79 per cent of the region's GDP, India has not sufficiently opened its markets to its neighbours – its trade with South Asia is about 3 per cent of its global trade (World Bank, 2018).

The integration imperative

This status-quo must change for India and the region to manage the renewable energy transition. Energy cooperation can enhance energy security by i) bringing together energy-rich and energy-scarce countries in the region, ii) allowing small countries with large natural resources to exploit economies of scale, iii) lowering prices through efficient use of domestic endowments, iv) reducing the need for capital investments (a regional electricity market would save BBIN countries an estimated US$17 billion in capital infrastructure through to 2045) and v) reducing environmental damage (Srivastava et al., 2007; World Bank, 2023).

But there are several obstacles (Asian Development Bank, 2013). Developing a regional power market to trade surplus electricity necessitates careful study of current power infrastructures and regulations. India must again play a leading role as the pillar for intra-regional transmission (Figure 4). Generating surpluses will require investment in infrastructure, supported by new financing mechanisms. Calculating and distributing surpluses will need technological and physical infrastructure to estimate demand and current endowments, as well as transmit electricity across borders. Finally, to facilitate transactions, regulations and governance must be harmonised to create a common framework.

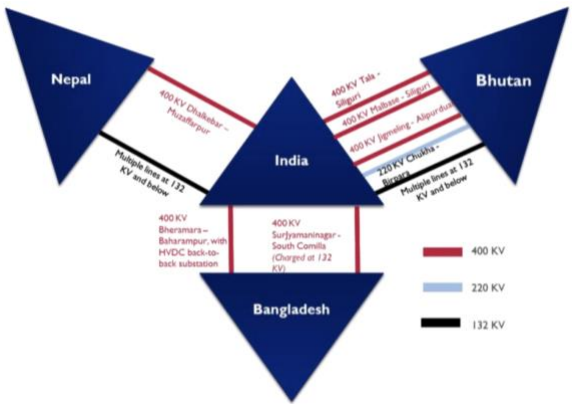

Figure 4. India must be the pillar of intra-regional transmission (IRADe, 2022)

A future agenda for regional cooperation should include three key issues (Srivastava et al., 2022). First, it should address non-tariff barriers by promoting standardisation of regulations, mutual recognition agreements and designing faster checkpoints to facilitate quicker clearances. Second, it should promote regional value chains, similar to the production linkages in East Asia that bring together Chinese manufacturing, Japanese know-how, skilled inputs from South Korea, Taiwan, Hong Kong and Singapore, and labour-intensive inputs from Indonesia, Malaysia, Philippines and Thailand. This can be done by lowering tariff and non-tariff barriers, improving market access and developing regional trade agreements. Third, it should prioritise regional cooperation on energy and transport networks. The aim is to move from bilateral power agreements to multilateral power agreements to a common unified market (Figure 5).

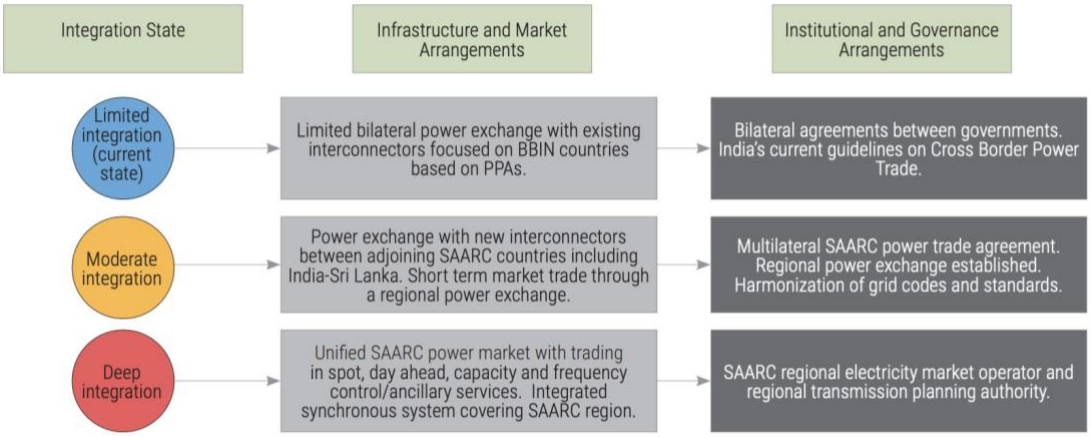

Figure 5. Levels of energy integration (UNESCAP, 2018a)

Vision for a New South Asia

Nepal, India and the region

We envisage Nepal as South Asia's renewable energy hub — a focal point for the region to pool its resources and expertise, maximising investment and creating the economies of scale necessary to lead the green transition. This is an ambitious vision that would see Nepal make a significant contribution to meeting the energy demands of the region.

Nepal would gain a critical industry to support its trade and development. India would forge a stronger relationship with its neighbours and secure reliable, cheap and green energy. For the region, cooperation will ensure reliable access to energy and enable countries to focus on other development imperatives.

To understand what a successful South Asian regional energy partnership could look like, we seek lessons from three cases where energy trade has catalysed economic integration and political stability.

Australia and Japan — trade and politics

Australia's energy relationship with Japan has driven economic growth in both countries by providing Australia with a stable market for its energy exports and ensuring a reliable supply of energy for Japan. But it was only 80 years ago that the two countries were at war.

In 1938, the future architect of the Australia-Japan relationship, Sir John Crawford, called for Australia to alleviate Japan's 'international economic grievances' through trade and link this 'to collective agreements in the interests of political security' (Crawford, 1938). Crawford identified Japan's energy insecurity as the root cause of its aggression and believed that there were some in Japan who would 'favour peaceful economic expansion' if Australia was prepared to facilitate it.

His words were not heeded, leading to further Japanese aggression as it sought to meet its resource needs in the Second World War. But the economic and political security compact was established through the 1957 Commerce Agreement, which propelled Japan to be Australia's most significant economic partner and closest ally in Asia.

This transformation was enabled by three key features. First, long-term contracts provided stability and predictability for both parties, including provisions for price-adjustments so agreements remained viable even as market conditions fluctuated. Second, joint investments in infrastructure, such as ports and pipelines, supported energy generation and distribution. Finally, the energy relationship was underscored by political cooperation through regular dialogue and diplomatic engagement that resolved issues as they emerged and ensured the smooth functioning of trade.

European Coal and Steel Community — regional integration

The European Coal and Steel Community was an international organisation formed after the Second World War to ensure that Germany could not establish a monopoly in coal and steel production (Alter and Steinberg, 2007). It was the precursor to the European Economic Community and the European Union.

The ECSC was governed by the High Authority, comprised of executives from each of the member countries. A key strength was its ability to engage wider society in public-corporate-union-community partnerships, driven by the Consultative Committee which had representatives from producers, workers, consumers and dealers in the coal and steel sector. The wide degree of consultation helped mobilise sectoral support for the ECSC and cut through protectionist tendencies.

The ECSC shows the importance of an impartial body to arbitrate disputes between state and non-state entities and the need for widespread buy-in from industry and society. It also demonstrates that sectoral integration is essential to set up trust-building exercises that, if successful, can lead to institutional integration. Finally, the ECSC showed that a common issue is critical to provide the impetus to overcome anxiety around integration. For Europe, it was post-war reconstruction; for South Asia, it could be climate change and green energy.

Southern African Power Pool — managing asymmetries

The Southern African Power Pool (SAPP) is a cooperative organisation operating under the Southern African Development Community (SADC), connecting the grids of its 13 members (SADC, 1994). The SAPP grants full membership to each state's public companies, and associate membership to its private companies. The region is dominated by South Africa,

which makes up 93 per cent of energy production, creating a size asymmetry similar to that between India and its neighbours.

The SAPP shows that an impartial, reliable and depoliticised body can underpin long-term and sustainable co-operation with minimal political backlash. The SAPP accomplishes this by institutionalising the public utility boards, rather than the state executive. It is organised as an inter-governmental organisation which gives equal importance to the national utilities of each SADC member, mitigating South Africa's size and creating the trust necessary for collective benefit. The SAPP has a technical assistance program which is essential for reaping the rewards of comparative advantages in energy resources across national boundaries, especially given size asymmetries.

Learning from other regions

South Asia needs a regional institution that can i) be a platform for discussion and consensus-building, including on harmonising regulations, ii) disseminate technology, iii) support research on technical issues and iv) enable capacity building and knowledge-sharing (IRADe, 2022).

Building on the lessons from other regions, we recommend creation of the South Asian Energy Authority (SAEA), outlined in Figure 6. SAEA would provide a body to lead regulatory harmonisation, creating common standards for energy production, transmission and distribution. It would create a regional energy market founded on the principles of mutual development and environmentalism. The SAEA would support sustainable energy policies by creating the certainty for potential energy exporters to invest in long-term green energy projects, thereby underwriting critical investments in infrastructure. It would have an independent dispute resolution process, an independent and impartial price setting mechanism, and serve a technical and advisory role for all members.

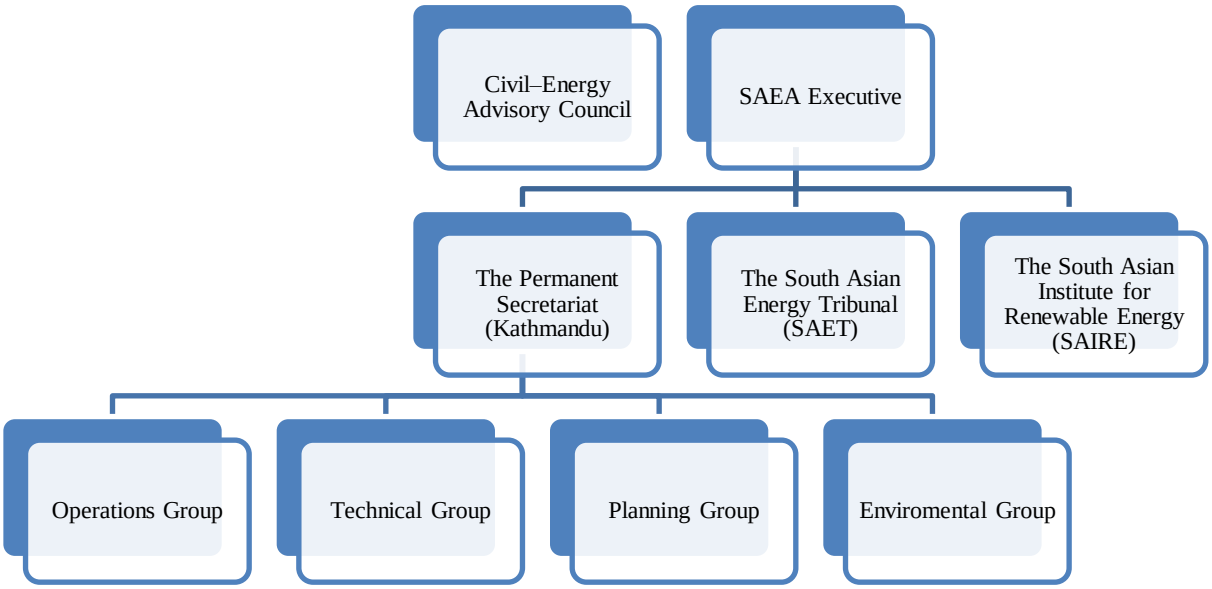

Figure 6. Proposed model for the South Asian Energy Authority (SAEA)

An important feature of the body is the South Asian Energy Tribunal (SAET), which would serve as the dispute resolution forum to help depoliticise regional energy disputes. Members should be selected either i) by consensus of all countries in the authority or ii) by each country nominating a member of the tribunal, which must then act by consensus. Tribunal members should be subject matter experts, such as in international trade law or energy economics, not hold any political affiliations, and able to act impartially without prejudice to the interests of any member country.

The body should begin initially between India, Bangladesh, Bhutan and Nepal (building on the BBIN infrastructure) and be open to members from all South Asian countries (defined by SAARC + Myanmar) so long as they are willing to comply with the mutually agreed principles of the body.

India must approach this body with a fundamentally different perspective than it has in previous regional engagements. Rather than seeking to exert power to maximise its short-term interests, it should act as the guarantor of the arrangement.

Conclusion: The Kathmandu Consensus

Hydropower could be the cornerstone for Nepal–India economic relations. A strategic partnership between the two countries would i) support India's growing energy needs, ii) underpin Nepal's economic development and iii) pave the way for stability and prosperity in one of the world's least integrated regions.

Our vision for Nepal–India relations and a new South Asia is summarised in what we call *The Kathmandu Consensus*, in which the region:

1. *Acknowledges* that Nepal is endowed with a unique potential for green energy and can become the centre for renewable energy in South Asia.

2. *Recognises* that for South Asia to achieve a successful green energy transformation before it suffers significant ecological devastation, it must co-operate on renewable energy initiatives, technology, and infrastructure.

3. *Supports* the alignment of South Asian nations on energy production to provide consistent, cheap, clean and cooperative green energy.

4. *Resolves* to work together to establish an integrated energy grid and common electricity market that will facilitate more efficient production and distribution of clean energy.

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