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**THE HISTORICAL EVOLUTION OF ENERGY
SOVEREIGNTY IN CENTRAL ASIA**

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ABSTRACT

The Historical Evolution Of Energy Sovereignty In Central Asia

Beksultan Bekiev

The goal of this thesis is to trace the historical evolution of energy sovereignty in Central Asia from the dissolution of the Soviet Union in 1991 to the present, conceptualizing sovereignty not as autarkic self-sufficiency but as the capacity to govern domestic resources through negotiated interdependence. Published literature has largely examined the region through the lenses of energy security and the water-energy-food nexus, but rarely through energy sovereignty as a primary framework; this thesis addresses that gap. It begins by examining the Soviet inheritance, an integrated power grid “Central Asian power system” (CAPS) and a seasonal water-for-fuel barter mechanism, and analyzes how this centralized architecture fractured into competing national strategies within the shifting geopolitical interests of Russia, China, and Western institutions. The research goal was achieved by a qualitative comparative historical case study, using document analysis and a most-similar systems comparison of two contrasting states. Kyrgyzstan and Uzbekistan are examined in depth because they represent the sharpest structural contrast across the region’s upstream-downstream, hydro-versus-hydrocarbon divide, while Kazakhstan, Tajikistan, and Turkmenistan provide regional context on grid synchronization, dam politics, and gas export corridors. The thesis finds that both states, from opposite resource endowments, pursue their flagship projects through external finance, technology, and ownership, and concludes that energy sovereignty in Central Asia is not an achieved state of isolationist autonomy but an ongoing process of managed interdependence, where national energy security depends on multilateral regional co-ownership and diversified external partnerships. Future research could address the study’s limitations by extending the framework to the three contextual states, drawing on Uzbek and Kyrgyz language sources and fieldwork, and examining whether states that host but do not own their generation can be said to be sovereign over it.

Keywords: Energy sovereignty, Central Asia, water-energy nexus, managed interdependence, post-Soviet states

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LIST OF ABBREVIATIONS

ADB:	Asian Development Bank
AIIB:	Asian Infrastructure Investment Bank
APERC:	Asia Pacific Energy Research Centre
BRELL:	Belarus, Russia, Estonia, Latvia and Lithuania power grid
BRI:	Belt and Road Initiative
CA:	Central Asia
CAES:	Central Asian Energy System
CAPS:	Central Asian Power System
CDC:	Coordinating Dispatch Center
CEPC CA:	Coordinating Electric Power Council of Central Asia
CESA:	Continental Europe Synchronous Area
CMEA:	Council for Mutual Economic Assistance
CNNC:	China National Nuclear Corporation
CU:	Customs Union
EAEU:	Eurasian Economic Union
EBRD:	European Bank for Reconstruction and Development
EIB:	European Investment Bank
EJOLT:	Environmental Justice Organisations, Liabilities and Trade
EPS:	Electric Power Systems
EU:	European Union
GDP:	Gross Domestic Product
GW:	gigawatt
GWh:	gigawatt-hour
HPP:	Hydropower Plant
HV:	High Voltage
IEA:	International Energy Agency
IPS:	Interconnected Power Systems
ISPG:	Interstate Power Grids
KEGOC:	Kazakhstan Electricity Grid Operating Company
kW:	kilowatt
kWh:	kilowatt-hour
MW:	megawatt
MWh:	megawatt-hour
OECD:	Organisation for Economic Co-operation and Development

OPEC: Organization of the Petroleum Exporting Countries

REMIT: Regional Electricity Market Interconnectivity and Trade

SCO: Shanghai Cooperation Organisation

SMR: Small modular reactor

SWP: Stiftung Wissenschaft und Politik

TAPI: The Turkmenistan-Afghanistan-Pakistan-India pipeline

UES: Unified Energy System

UES CA: Unified Energy System of Central Asia

UN ESCAP: United Nations Economic and Social Commission for Asia and the Pacific

UN SPECA: Special Programme for the Economies of Central Asia

UNECE: United Nations Economic Commission for Europe

UPS: Unified Power System

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CHAPTER 1: INTRODUCTION

1.1 Preamble

Throughout history, the political geography of Central Asia has been fundamentally defined by the dynamics of energy. Although the notion of a distinct Central Asia reaches back to 19th-century geography, its modern meaning was settled only in 1993, when the newly independent republics of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan formally adopted the term and, with it, a shared agenda in which energy cooperation featured as a major pillar of intergovernmental relations. That agenda was built on a Soviet inheritance which was an integrated power grid, commonly known as the Central Asian electricity ring or Central Asian Power System (CAPS), founded on the exchange of hydropower from upstream countries for hydrocarbons from downstream countries, which bound the five states together even as independence pulled them toward separate national strategies. The friction between this inherited interdependence and each state's drive to command its own resources lies at the core of what this thesis calls energy sovereignty. This research traces the historical evolution of that concept in Central Asia and considers how five states have sought to reconcile the claims of national sovereignty with the physical and economic realities of a shared energy system.

This thesis examines energy sovereignty in Central Asia in state-centric terms, understood as the capacity of a state to exercise autonomous control over its energy resources, infrastructure and policy, and to secure reliable supply without subordinating its interests to external actors.¹ Sovereignty is treated as related to, but distinct from, energy security and energy independence,² and the community-level and energy-justice readings of the term are set aside.³ Geographically, the study is confined to the five post-Soviet republics: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan, and excludes territories such as Afghanistan and Xinjiang that are sometimes grouped with the region. Temporally, it traces the evolution of energy sovereignty from the Soviet integrated grid of the 1950s, referred to here as the Interstate Power Grids (ISPG), through the fragmentation and partial reconstruction of regional cooperation after independence in 1991, to the present.

The empirical analysis is developed through a paired case study of Kyrgyzstan and Uzbekistan, selected because they occupy opposite poles of the region's upstream-downstream, water-energy divide and therefore express the tension between shared infrastructure and national control. The remaining three republics: Kazakhstan, Tajikistan, and Turkmenistan are integrated throughout the analysis as essential contexts regarding grid synchronization, upstream dam dynamics, and gas export corridors. Detailed engineering assessments of transmission assets, and the broader global mechanics of the renewable energy transition fall outside the study's scope.

1.2 Structure of thesis

This thesis investigates energy sovereignty through a comparative, multidimensional framework that integrates historical and geopolitical perspectives. It comprises five chapters. Chapter 1 introduces the research context and objectives, defining the scope and structure. Chapter 2 critically reviews the literature, covering the theoretical framework, the historical evolution of the regional grid, and the strategic and geopolitical influences that shape it. Chapter 3 outlines the methodology and research questions. Chapter 4 presents empirical findings from the case studies. Chapter 5 summarises the findings, discusses limitations, and offers recommendations for future research.

¹ Thaler and Hofmann (2022); Westphal (2021).

² Thaler and Hofmann (2022); Krut et al. (2009).

³ Laldjebaev, Sovacool and Kassam (2016).

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

To analyse energy sovereignty in post-Soviet Central Asia, it is necessary to examine the physical and institutional architecture from which these newly independent states emerged. The assertion of national energy sovereignty does not occur in a vacuum; it is fundamentally constrained and shaped by historical path dependency. The physical infrastructure of Central Asia's energy sector was engineered not as five discrete national networks but as a single, interdependent regional mechanism embedded within the broader Soviet energy system. Understanding the evolution and mechanics of the Soviet-era ISPG, and specifically the CAPS, is therefore essential to defining what energy sovereignty can mean in the region today.

This chapter proceeds in several steps. Section 2.2 sets out the theoretical framework, moving from the dominant energy security paradigm to the more political concept of energy sovereignty and situating both alongside the adjacent ideas of energy independence, energy justice, path dependency and interdependence on which the thesis draws. Section 2.3 reconstructs the architecture of the Soviet interstate grid, and Section 2.4 narrows the focus to the CAPS and its post-1991 fragmentation. Section 2.5 turns to the geopolitics of sovereignty, examining both the internal contest among the five states and the external competition among Russia, China and the Western powers. Section 2.6 draws the threads together and identifies the gap this thesis addresses.

2.2 Theoretical framework of energy sovereignty

To analyze the political and structural consequences of inherited critical infrastructure, one must distinguish between the technical mandate of energy security and the political imperative of energy sovereignty. This section builds that distinction in stages. It begins with the conventional security paradigm and its well-known Four A's, turns to the critiques that reconceptualised energy security from within, separates energy sovereignty from the neighbouring notions of energy security and energy independence, traces its intellectual descent from food sovereignty, and finally introduces the supporting concepts like path dependency, rentier dynamics and interdependence that structure the empirical chapters.

2.2.1 The conventional paradigm of energy security

Traditionally, the energy policy literature has defined energy security through market-oriented, utilitarian frameworks. The most influential formulation is the Four A's set out by the Asia Pacific Energy Research Centre (APERC).⁴ Energy security is commonly evaluated through four key pillars:⁵

1. Availability: Physical access to energy resources in sufficient quantities.
2. Affordability: Fair and stable pricing that allows households and industries to access energy without financial hardship.
3. Accessibility: Overcoming geographic, political and technological barriers to deliver energy to end-users.
4. Acceptability: Ensuring that energy sourcing aligns with environmental standards, social needs and public support, including decarbonisation efforts.

⁴ APERC (2007); Cherp and Jewell (2014).

⁵ Strojny et al. (2023).

Table 1 summarises the four dimensions, pairing each with its guiding question, its main operational metrics, and the era in which it rose to prominence.

Table 1: Core dimensions of the Four A's energy security framework⁶

Dimension (Four A's)	Core Focus Question	Key Components and Operational Metrics	Era and Focus
Availability	Does energy flow reliably and exist in sufficient physical volume?	Geological reserves, fuel supply stability, diversification of import sources, uninterrupted primary supply.	Classic (20th century)
Affordability	Is energy priced reasonably without harming economic performance?	Cost of supply, price stability/volatility, fuel subsidies, household energy expenditure burdens.	Classic (20th century)
Accessibility	Can all social actors and regions connect to and use energy services?	Infrastructure reach, grid connection rates, fuel poverty alleviation, equity in distribution.	Contemporary (21st century)
Acceptability	Is energy production and consumption environmentally and socially sustainable?	Carbon emissions, air/water pollution, environmental degradation, public acceptance, climate mitigation.	Contemporary (21st century)

In each case the framework asks whether supply is physically present, economically bearable, practically obtainable and socially tolerable. Under this paradigm a state achieves energy security by minimising vulnerabilities in its vital energy flows and ensuring an uninterrupted supply of fuel and power, largely irrespective of where those inputs originate or who maintains operational control over them.

The appeal of the Four A's lies in their breadth and simplicity: they translate a diffuse anxiety about supply into a checklist that policymakers can operationalise. For that reason they remain the reference point for national energy strategies, including those of the Central Asian republics, which routinely justify new generation capacity, pipelines and grid upgrades in the language of availability and affordability. Precisely because the framework is silent on ownership and control, however, it leaves unexamined the questions that this thesis treats as central.

When applied to Central Asia, the Four A's framework illustrates a polarized regional architecture:

1. **Availability:** Downstream states (Kazakhstan, Turkmenistan, and Uzbekistan) rely on vast but depleting fossil reserves, while upstream states (Kyrgyzstan and Tajikistan) face cyclical winter deficits despite rich summer hydropower resources.
2. **Affordability:** Heavily subsidized domestic tariffs protect consumers from price shocks but suppress utility revenues needed for system maintenance.
3. **Accessibility:** Universal Soviet-era grid coverage is compromised by high technical line losses and uneven access to clean domestic heating.
4. **Acceptability:** Downstream thermal emissions and poor air quality stand in tension with the transboundary hydrological risks of upstream mega-dams.

⁶ APERC (2007).

Table 2 applies the Four A's across the region's upstream and downstream states and, in its final column, shows where each dimension leaves the question of ownership and control, the sovereignty gap, unaddressed.

Table 2: Application of the Four A's energy security framework across Central Asian republics⁷

Dimension (Four A's)	Core Analytical Question	Upstream Manifestation (Kyrgyzstan and Tajikistan)	Downstream Manifestation (Kazakhstan, Turkmenistan, Uzbekistan)	Central Thesis Critique (Sovereignty Gap)
Availability	Is energy physically present in sufficient quantities?	Abundant summer hydropower; acute winter generation deficits requiring emergency fuel/power imports.	Vast fossil fuel reserves (coal, gas, oil), but facing accelerating domestic depletion and rising internal demand.	Ignores geopolitical control: a nation can have high physical availability while relying entirely on foreign-owned pipelines or grids.
Affordability	Is energy priced reasonably without causing economic distress?	Low consumer tariffs suppress utility revenues, leading to underinvestment and delayed plant modernization.	Artificially suppressed consumer prices via heavy state subsidies (amounting to 3%–14% of GDP).	Evaluates pricing as a market efficiency metric rather than an authoritarian political tool to maintain social stability.
Accessibility	Can infrastructure deliver power to end-users without barriers?	High grid reach inherited from the USSR, but vulnerable to seasonal line losses and rural clean-cooking deficits.	Fragmented national grids post-1991; significant rural reliance on polluting cooking fuels despite universal electricity access.	Overlooks transit vulnerability: cross-border transmission lines depend on upstream/downstream political consent.
Acceptability	Is production and use environmentally and socially tolerable?	Low-carbon hydropower generation, but mega-dams alter transboundary river flows and downstream agricultural cycles.	High carbon intensity (coal in Kazakhstan, gas in Uzbekistan) and severe particulate air pollution (PM2.5).	Subordinates transboundary ecological security and national self-determination to generic global decarbonization metrics.

⁷ Compiled by the author based on theoretical criteria from APERC (2007) and Cherp and Jewell (2014), with empirical data from UN ESCAP/SPECA (2018), IEA (2020a-c, 2022a-c), and Jalilov et al. (2016).

2.2.2 The Five S's security matrix relation to energy sovereignty

While the APERC Four A's provide a broad market and consumer facing taxonomy, defence oriented and geopolitical analyses frequently operationalise energy security through the Five S's framework.⁸ First articulated in strategic security evaluations by the US Department of Defense and synthesised in energy security reviews, the Five S's define energy security across five operational imperatives:

1. **Surety:** Certainty of access and political/institutional guarantees over fuel flows and primary energy supplies.
2. **Survivability:** Physical resilience and durability of infrastructure against targeted strikes, human error, natural disasters, and cascading failures.
3. **Supply:** The geological and physical availability of primary energy resources.
4. **Sufficiency:** Quantitative adequacy of supply relative to domestic demand across all economic sectors and seasonal fluctuations.
5. **Sustainability:** Prolongation of energy resource production with active mitigation of socio-ecological and transboundary impacts.

Compared to the Four A's, the Five S's framework places greater emphasis on systemic resilience (survivability) and institutional certainty (surety), capturing the vulnerability of centralized generation and cross-border grids. However, when applied to post-Soviet Central Asia, the Five S's reveal the same fundamental structural paradox: Soviet-era regional planning achieved supply, sufficiency, and sustainability through collective interdependence, yet independent statehood incentivized individual republics to seek unilateral surety and survivability by dismantling shared infrastructure.⁹

Table 3 traces this paradox across the five dimensions, setting each against its upstream and downstream application and, in the final column, the sovereignty gap it exposes.

Table 3: Application of Five S's security matrix on Central Asian republics¹⁰

Dimension (Five S's)	Core Strategic Meaning	Central Asian Upstream Application (Kyrgyzstan and Tajikistan)	Central Asian Downstream Application (Kazakhstan, Turkmenistan, Uzbekistan)	Central Thesis Critique (Sovereignty Gap)
Surety	Certainty of contractual and political access to fuel/power flows.	Structurally insecure; dependent on seasonal fossil/power delivery agreements with downstream neighbors.	Subject to geopolitical transit pressures and export commitments to external powers (e.g., China, Russia).	Surety cannot be solved unilaterally when fuel supplies or export corridors cross international borders.

⁸ Sovacool and Saunders (2014).

⁹ Paravantis (2019).

¹⁰ Compiled by the author based on theoretical criteria from Sovacool and Saunders (2014).

Dimension (Five S's)	Core Strategic Meaning	Central Asian Upstream Application (Kyrgyzstan and Tajikistan)	Central Asian Downstream Application (Kazakhstan, Turkmenistan, Uzbekistan)	Central Thesis Critique (Sovereignty Gap)
Survivability	Durability of assets against shocks, systemic failures, and outages.	Fragile; Toktogul and Nurek cascades face siltation, climate change risks, and winter freeze vulnerability.	High vulnerability to technical cascading trips (e.g., January 2022 blackout) and aging thermal plant fleets.	Fragmenting synchronized grids reduces system inertia, weakening network survivability rather than strengthening it.
Supply	Physical/geological presence of domestic primary energy.	Hydro-rich (~80% of regional water resources), but virtually devoid of domestic oil and natural gas.	Vast coal, gas, and oil reserves; domestic gas fields are now maturing and depleting.	Having domestic physical supply does not guarantee domestic control over extraction assets or distribution grids.
Sufficiency	Quantitative volume matching real-time domestic peak demand.	Severe seasonal deficits; acute winter shortages requiring emergency electricity imports.	Summer power deficits and gas delivery bottlenecks during extreme winter cold snaps.	Equating aggregate annual capacity with sufficiency masks severe seasonal and load-balancing deficits.
Sustainability	Long-term operational continuity and ecological impact mitigation.	Clean renewable hydro generation, but altered seasonal river flows risk downstream agricultural collapse.	Severe environmental degradation (Aral Sea desiccation) and heavy carbon/particulate emissions.	National sustainability strategies clash when upstream hydro timing conflicts with downstream seasonal irrigation needs.

2.2.3 Critiques and the reconceptualisation of energy security

The Four A's have been criticised as analytically vague. Winzer argues that the concept of energy security is stretched so widely that it loses precision, and proposes reducing it to a single core idea, the continuity of energy supply.¹¹ More consequentially for this thesis, Cherp and Jewell, in their influential critique "Beyond the Four A's", contend that the standard framework fails to specify security for whom, from what, and by what means.¹² They reframe energy security through three analytical perspectives drawn from different disciplines: a sovereignty perspective, rooted in geopolitics and international relations, which foregrounds control, ownership and the threat of hostile

¹¹ Winzer (2012).

¹² Cherp and Jewell (2014).

external actors; a robustness perspective, drawn from engineering and the natural sciences, which addresses physical failure, resource depletion and technical reliability; and a resilience perspective, derived from complex-systems thinking, which stresses the capacity to absorb and adapt to unpredictable shocks.

This reconceptualisation matters because it locates sovereignty inside the energy security debate rather than outside it. It shows that questions of who controls energy flows were never truly absent from the security literature; they were merely subordinated to the technical concern with continuity. Central Asia's experience, examined below, bears directly on this argument: the region's post-Soviet history is precisely a case in which the sovereignty perspective and the robustness perspective diverged, as states sacrificed technical reliability in pursuit of political control.

2.2.4 Conceptual triad of security, independence, and sovereignty

Because the three terms are often used loosely and interchangeably, it is worth separating energy security, energy independence and energy sovereignty. Energy security, as above, concerns the reliable and affordable availability of supply. Energy independence describes a reduced reliance on imported energy, in its strongest form the elimination of dependence on foreign suppliers. Scholars distinguish between energy independence and energy security, with the former focused only on reducing the share of imported energy in the national energy mix.¹³ Independence is frequently invoked rhetorically and, taken to its logical end, points toward autarky; yet it says nothing about who owns or governs the domestic energy system. A state can be energy independent while its resources are controlled by foreign capital, and it can be import dependent while retaining firm sovereign control over the terms of that dependence.

Energy sovereignty is distinct from both. It asks not whether energy flows consistently, nor merely whether it is domestically sourced, but who controls those flows, through what institutions, and to whose political benefit.¹⁴ Critical-geopolitics, political-ecology and energy democracy scholars argue that the classical security paradigm, in prioritising uninterrupted supply at predictable prices, routinely obscures the asymmetrical power relations, rent-sharing arrangements and extractivist dynamics embedded in energy infrastructure. Where energy security asks whether the lights stay on, energy sovereignty asks in whose hands the switch sits.¹⁵

¹³ Kim et al. (2024).

¹⁴ Sorman et al. (2020).

¹⁵ Cherp and Jewell (2011); Sorman et al. (2020).

Table 4 sets the three concepts side by side, pairing each with the core question it asks and the literature associated with it, and makes explicit the distinction on which this thesis rests: that sovereignty, unlike security or independence, is a question of control rather than of supply or origin.

Table 4: Conceptual comparison of energy security, energy independence, and energy sovereignty¹⁶

Concept	Core question it asks	Associated literature
Energy security	Does energy flow reliably and affordably?	APERC (2007); Winzer (2012); Cherp and Jewell (2014)
Energy independence	Is energy domestically sourced (rather than imported)?	Cohen et al. (2011); Thaler and Hofmann (2022)
Energy sovereignty	Who controls the flows, through what institutions, and to whose benefit?	Sorman et al. (2020); Ariza-Montobbio (2015); Thaler and Hofmann (2022)

2.2.5 The food-sovereignty lineage

The concept of energy sovereignty is adapted from the grassroots framework of food sovereignty, coined by the transnational peasant movement La Via Campesina at the 1996 World Food Summit and elaborated in the 2007 Nyéléni Declaration.¹⁷ Food sovereignty was formulated in explicit contrast to “food security”: where security asks only whether people have enough to eat, sovereignty asserts the right of communities to define their own food and agricultural systems and to resist the corporate, export-oriented model that security discourse leaves unquestioned. Transposed to energy, the framework carries the same critical charge. It contrasts securitised framings by acknowledging the uneven power dynamics, values and identities attached to energy production and consumption, and it is broadly conceptualised as the right and structural capacity of a political community—whether a state, region or populace to exercise autonomous authority over the governance, regulation, production and distribution of its energy systems.¹⁸ Rather than treating energy purely as a tradeable commodity, the energy sovereignty framework politicises energy, treating infrastructure and natural resources as core components of national self-determination and sovereign statehood.¹⁹

2.2.6 Adjacent framings of energy justice and energy democracy

Two neighbouring literatures share this politicising impulse. Energy justice applies distributive, procedural and recognition-based principles of justice to the costs and benefits of energy systems, asking who bears the burdens of extraction and who enjoys the benefits of supply.²⁰ Energy democracy emphasises popular ownership of, and participation in, energy decision-making, typically at the community scale.²¹ Both readings usually locate the relevant political community below the level of the state—in municipalities, cooperatives or affected populations. This thesis acknowledges these community-level and energy-justice readings but sets them aside, adopting instead a state-centric conception of sovereignty appropriate to a region in which the central actor asserting control over energy has, since 1991, been the newly independent nation-state.

¹⁶ Compiled by the author based on Chapter 2.

¹⁷ La Via Campesina (1996); Nyéléni Forum (2007).

¹⁸ Schelly et al. (2020); Timmermann and Noboa (2022).

¹⁹ Ariza-Montobbio (2015).

²⁰ Sovacool and Dworkin (2015); Jenkins et al. (2016).

²¹ Szulecki (2018).

2.2.7 Sovereignty as autonomy and as interdependence

A central analytical move of this thesis is to treat energy sovereignty not as a binary sovereign or not, but as a spectrum running from autonomy to interdependence. In its maximal form, sovereignty is read as autonomy: the capacity to act without reliance on others. Yet as the interdependence literature in international relations has long argued, few states in a densely networked world are genuinely autonomous, and mutual dependence is not necessarily a loss of sovereignty so much as a condition to be managed.²² This yields the notion of pooled or shared sovereignty, familiar from studies of regional integration, in which states voluntarily coordinate and cede a measure of unilateral control in exchange for collective gains. The distinction is essential to the Central Asian case, because it separates the imposed integration of the Soviet period from the negotiated interdependence toward which later cooperation agreements gesture. Sovereignty, on this reading, can be exercised through cooperation as well as against it.

2.2.8 Path dependency and the resource lens

Two further concepts frame the empirical analysis.

1. The first is path dependency. Path dependency theory holds that early structural choices, once embedded, constrain later options through increasing returns and rising switching costs.²³ Applied to Central Asia, the argument is that the Soviet grid was engineered as a single mechanism, so that the pursuit of full national independence decades later is expensive and, for some states, close to unattainable in the medium term. Inherited infrastructure is thus not a neutral backdrop but an active constraint on the sovereignty that states can realistically claim.
2. The second is the family of rentier-state and resource-curse arguments. Rentier-state theory observes that states which derive large revenues from natural-resource rents tend to develop distinctive political economies, insulated from domestic taxation and prone to particular governance pathologies,²⁴ while the related resource-curse thesis links resource abundance to weaker long-run development.²⁵ These arguments are directly relevant to the region's hydrocarbon exporters like Turkmenistan, Uzbekistan and Kazakhstan, whose gas and oil rents shaped both their external leverage and their internal incentives, and they help explain why the shift toward domestically controlled renewables represents not merely a technical transition but a potential reconfiguration of the sovereign bargain.

2.2.9 Application to post-Soviet Central Asia

In post-Soviet Central Asia this theoretical apparatus is not merely academic. For newly independent states, energy policy could not remain a purely technical exercise in security or market efficiency. Because physical generation nodes and regional dispatch mechanisms were inherited as instruments of Soviet-era centralised control, asserting authority over energy networks became synonymous with asserting national sovereignty itself. The sections that follow reconstruct that inheritance before showing how the tension between security and sovereignty, and between autonomy and interdependence, has played out in practice. The five republics that make up the region, and their upstream-downstream geography, are shown in the political map in Section 4.2 (Figure 4.1).

²² Keohane and Nye (1977).

²³ David (1985); Arthur (1989); Pierson (2000).

²⁴ Mahdavy (1970); Beblawi (1987).

²⁵ Auty (1993).

2.3 Historical context of the USSR interstate power grid

The development of the Soviet Unified Power System (UPS) began and its international extension, the MIR ISPG, was established under the Council for Mutual Economic Assistance (CMEA) in 1959. It demonstrated the Soviet Union's structural preference for large-scale, centralized, and synchronized power networks.

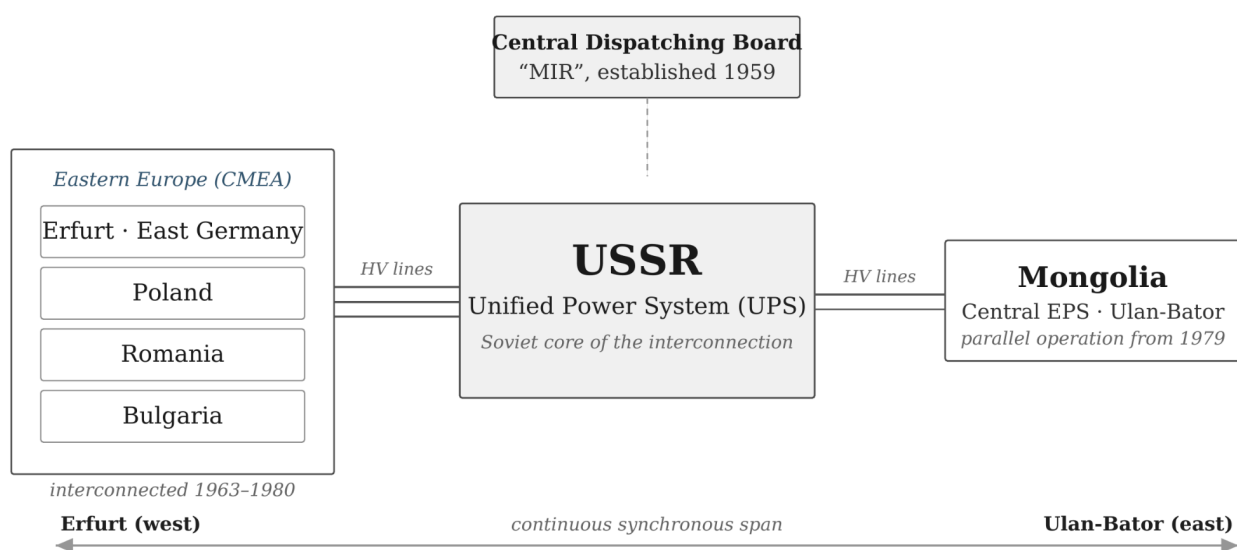
In 1959, the CMEA initiated the integration of Electric Power Systems (EPS) across the USSR and Eastern Europe. This major effort followed a report approved by the Commission on Energy Exchange and Complex Use of Hydro Resources of the Danube River, establishing the framework for interconnecting national power grids to facilitate mutual electricity trade. In the same year, member states signed an agreement establishing the Central Dispatching Board, known as MIR, to oversee the newly interconnected power systems of Eastern Europe and the Soviet Union.

From 1963 until 1980, this interstate electric network interconnection was continuously enlarged, connecting Romania, Poland, and Bulgaria to the USSR. In 1979, the entire UPS of the USSR was operated in parallel with the Central EPS of Mongolia. Consequently, the MIR ISPG covered the area from Ulan-Bator (Mongolia) in the east to Erfurt (East Germany) in the west, becoming the largest ISPG worldwide, with an installed power plant capacity exceeding 400 GW.²⁶

Figure 2.1 shows the extent of the MIR interstate grid at its height. A continuous synchronous system reaching from Erfurt in the west to Ulan-Bator in the east, coordinated centrally and, by 1979, the largest interstate power grid in the world.

The MIR Interstate Power Grid (UPS), 1959–1991

Integrated under the CMEA; the largest interstate grid in the world by 1979



Over 400 GW installed capacity — the world's largest interstate power grid at its 1979 peak.

Figure 2.1: The MIR interstate power grid (UPS), 1959–1991

2.3.1 Post-Soviet grid systems and reorganization

With the dissolution of the Soviet Union and the CMEA in 1991, the MIR grid ceased operations in its original form. Eastern European countries subsequently integrated into the Western European interconnected power system. The Baltic states, which were part of the Belarus, Russia, Estonia, Latvia and Lithuania (BRELL) power grid, successfully synchronised their electricity systems with

²⁶ Voropai et al. (2021).

the Continental Europe Synchronous Area (CESA) via Poland on 9 February 2025.²⁷ The former Soviet republics reorganized the USSR's original UPS into an interstate energy network known as the Interconnected Power System (IPS).²⁸

Figure 2.2 traces what became of that system after 1991, as the single synchronized grid fragmented into three trajectories: Eastern Europe joining the Western European grid, the Baltic states synchronizing with Continental Europe, and the former Soviet republics regrouping into the IPS.

From MIR to IPS: Reorganization of the Post-Soviet Grid

The dissolution of the USSR and CMEA in 1991 fragmented a single synchronized system

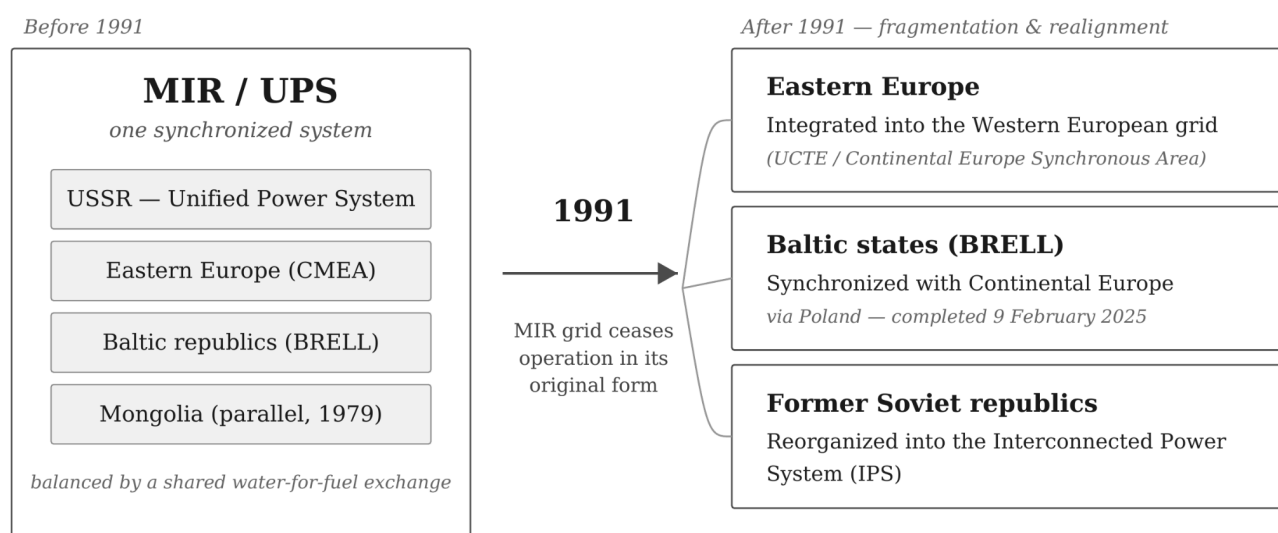


Figure 2.2: Reorganization of the post-Soviet grid, 1991

Although cross-border power integration across former Soviet states currently remains limited, substantial growth potential persists. For example, joint usage of Tajik and Kyrgyz hydropower resources offers reduced tariffs for Central Asian consumers; however, regional political tensions continue to hinder its full execution. Looking forward, initiatives to create a common electricity market under the Customs Union (CU) and Eurasian Economic Union (EAEU)²⁹ are projected to reverse this period of disintegration, aligning the region with broader global integration trends.

2.4 Development and structure of the Central Asian power system

Between the 1960s and 1980s, Soviet planning produced the CAPS and the broader Central Asian Energy System (CAES)-a complex web of synchronized electricity grids, gas pipelines, and seasonal water management protocols spanning Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan.³⁰ Developed under Soviet guidance independently of the USSR's main grid, CAPS linked the region into an integrated "energy ring" managed by the Coordinating Dispatch Center (CDC) "Energia" in Tashkent and created the Unified Energy System of Central Asia (UES CA).³¹

Integrated within the Soviet-designed CAES, CAPS formed part of an interdependent network of pipelines and power lines balancing regional priorities:

- Fossil-rich downstream nations (Kazakhstan, Turkmenistan, and Uzbekistan) provided thermal power, natural gas, and petroleum to upstream states.³²

²⁷ Council of the EU, Doc. 6668/25 (2025).

²⁸ IEA (2014); IEA (2015).

²⁹ Zemskova (2018).

³⁰ Rakhmatullaev et al. (2017); Aminjonov (2018); Saidmamatov et al. (2020).

³¹ Saidmamatov et al. (2020).

³² Rakhmatullaev et al. (2017); Saidmamatov et al. (2020).

- Mountainous upstream nations (Tajikistan and Kyrgyzstan) regulated water flows for downstream agricultural irrigation while exporting summer hydroelectricity, thereby enhancing both energy security and the potential for renewable power consumption across the region.³³

Figure 2.3 depicts the integrated “energy ring” as Soviet planners designed it, showing the seasonal exchange of upstream water for downstream fuel and power that bound the five republics into a single system.

The Central Asian Energy Ring (CAPS)

Soviet-era water-for-fuel exchange, coordinated from Tashkent

Upstream — water & hydropower

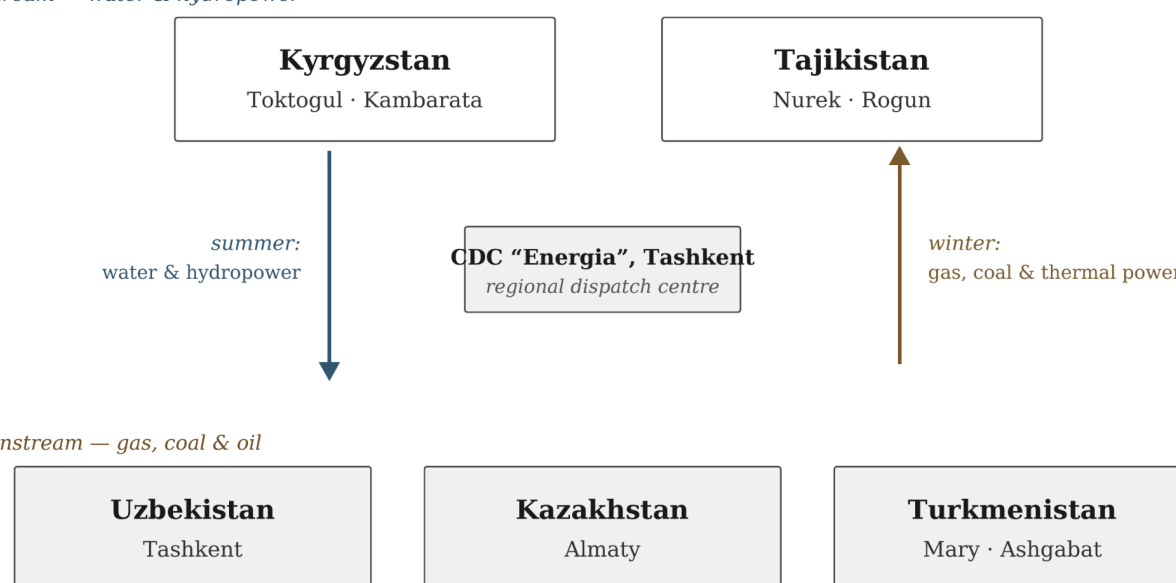


Figure 2.3: Central Asian energy ring diagram³⁴

2.4.1 The USSR grid legacy and energy sovereignty

This historical period matters for three distinct reasons:

1. Physical infrastructure and border rigidities. The physical infrastructure including high-voltage transmission lines, generation nodes, and water controls was built across internal Soviet administrative boundaries that suddenly became rigid international borders after December 1991.³⁵
2. Centralized institutional governance. Its institutional design depended on a centralized command center in Tashkent that prioritized regional agricultural and power efficiency over individual state sovereignty.³⁶
3. Water-energy interdependence. It established a deeply intertwined water-energy trade-off where upstream states held winter water for downstream summer irrigation in return for seasonal deliveries of natural gas, coal, and thermal power from downstream neighbors.³⁷

³³ Aminjonov (2018).

³⁴ Created by the author.

³⁵ Menga (2018); Westphal et al. (2022).

³⁶ Weinthal (2001); Zakhirova (2013).

³⁷ Jalilov et al. (2016).

2.4.2 Post-Soviet fragmentation and re-integration efforts

Following the Soviet collapse in 1991, the Central Asian system fractured due to lost centralized oversight, tariff disparities, and geopolitical friction. This breakdown ended coordinated resource management between upstream hydropower and downstream agriculture, leaving each nation to pursue isolated energy policies at the expense of regional stability.³⁸

Driven by growing energy concerns, the Central Asian governments agreed in 1999 to restore historical ties³⁹ and signed an intergovernmental agreement that created a framework for parallel grid operation and the Coordinating Electric Power Council of Central Asia (CEPC CA), with the Tashkent-based “Energia”.⁴⁰

Figure 2.4 sets out the system’s trajectory as a timeline, tracing the alternating pattern of fragmentation and integration from the grid’s construction, through the withdrawals of the 2000s, to the negotiated reintegration of the present.

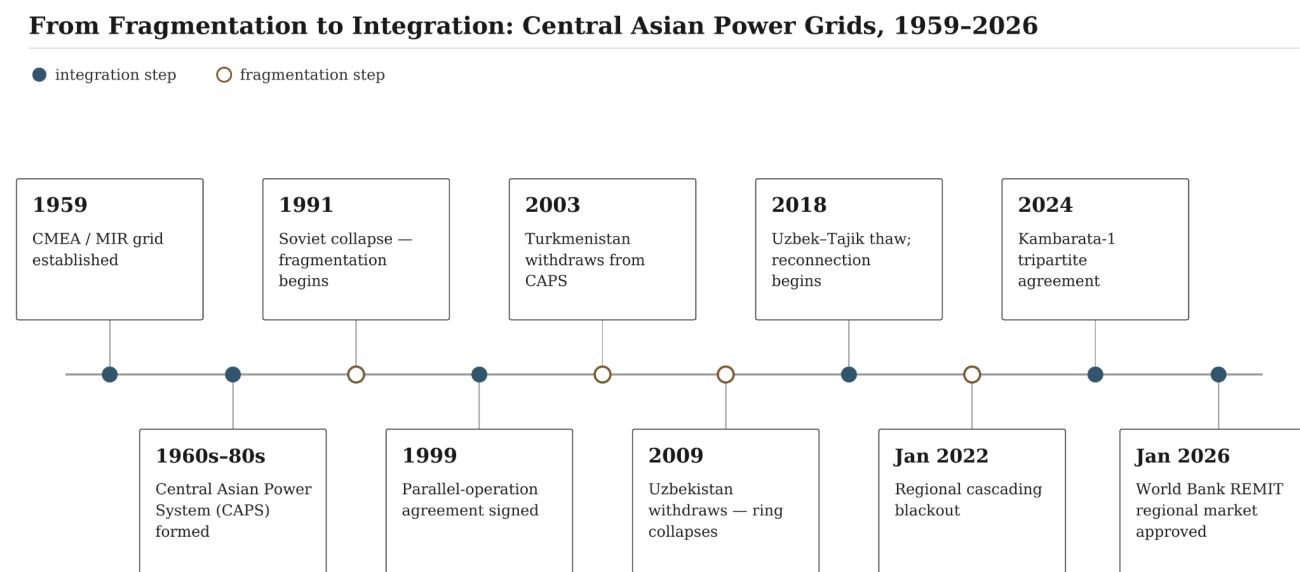


Figure 2.4: The Evolution of Central Asian Power Grids (1959-2026)⁴¹

2.4.3 The Central Asian unified energy system today

The re-integration launched by the 1999 agreement (Section 2.4.2) has since taken concrete shape, and its present state can be read from a 2023 briefing by the region’s own dispatch centre.⁴² Under the Bishkek agreement of that year, the power systems of Kazakhstan, Kyrgyzstan and Uzbekistan now operate in parallel as the UES CA, connected by transmission lines of 220 to 500 kilovolts. Tajikistan, which had run in isolation from the system since 2009, was being reconnected through the southern grid of Uzbekistan, following the 2018 thaw in Uzbek-Tajik relations and achieving full synchronous reconnection by 2024, a step supported by the Asian Development Bank (ADB), while Turkmenistan continues to operate autonomously and trades with the system across its borders.

The system is run through those same institutions. Day-to-day operation is coordinated by the Tashkent-based CDC “Energia”, while the CEPC CA serves as the consultative body in which the members agree the rules of parallel operation; its decisions, taken by open vote, are binding on the

³⁸ International Crisis Group (2002).

³⁹ Agreement on the Use of Water and Energy Resources of the Syr Darya River Basin (1998).

⁴⁰ Agreement on Parallel Operation of the Energy Systems of Central Asian States (1999).

⁴¹ Created by the author.

⁴² Briefing by the CDC “Energia”, Mirzaev (2023).

participants. This is a working example of the pooled coordination discussed earlier: the states keep their national systems but accept common rules in order to hold the shared grid stable.

Trade across the system still follows the seasonal logic of the old barter. The upstream states, Kyrgyzstan and Tajikistan, export hydroelectricity in summer, when their plants run at full load, and import in winter, when they fall short; the main net exporters are Turkmenistan (via continuous, gas-fired thermal generation) and Tajikistan (driven by large summer hydropower surpluses that outweigh its chronic winter deficits, exported primarily to Afghanistan and Uzbekistan). Trade is arranged through bilateral contracts, with separate transit agreements where power crosses a third country, so that a delivery from Turkmenistan to Kyrgyzstan, for example, requires a transit contract with Uzbekistan.

Two further changes are reshaping the system. Demand is rising across the region, by roughly a third in Uzbekistan between 2016 and 2022, which is part of what drives the new capacity examined in Chapter 4. And the members are reforming their markets: Kazakhstan moved to a single-buyer and balancing model in 2023, and Uzbekistan established an energy-market regulator the same year and began a phased shift toward wholesale and retail electricity trading.⁴³ These reforms bear on sovereignty because they change who sets prices and terms inside each national system, even as the systems themselves grow more tightly linked.

2.5 Energy sovereignty and geopolitics

To bridge the local infrastructure legacy of CAPS with global power projections, this section analyzes how external powers exploit the inherited infrastructure that Section 2.4 described as an instrument of centralized Soviet control. After 1991 the geopolitics of energy sovereignty in the region ran along two axes: internally, among the five states, and externally, among the outside powers competing for influence. Energy sovereignty is therefore double-edged, involving the assertion of control both against neighbours and against new external patrons.

2.5.1 Infrastructure, sovereignty and interdependence

The most striking empirical feature of the region's post-Soviet trajectory is that several Central Asian states pursued sovereignty by physically fragmenting the shared grid, even at the expense of energy security. Turkmenistan withdrew from the CAPS in 2003, pivoting toward parallel operation with Iran's network, and Uzbekistan's withdrawal in 2009 effectively collapsed the energy ring and severed Tajikistan from it. Governments explicitly reframed independent energy policy as a sovereignty gain—a move that, several analysts note, slid into isolationism. The costs of this fragmentation became visible in the region-wide blackout of January 2022, which cascaded across Kazakhstan, Kyrgyzstan and Uzbekistan and exposed the fragility of a disaggregated system. Here the security logic of the Four A's and the sovereignty logic pulled in opposite directions: the assertion of national control undermined the reliability that security demands. This is the central paradox on which the thesis builds that in Central Asia energy security and energy sovereignty, so often treated as complementary, behaved as substitutes.

2.5.2 External powers and the strategy of multi-vectorism

Beyond the contest among the five states lies a second axis of competition, among the external powers that have sought influence in the region since 1991. This external dimension is frequently described through the frame of a “New Great Game,”⁴⁴ an echo of the 19th-century imperial rivalry that risks overstating the agency of outside powers and understating that of the states themselves. For

⁴³ Rozanskij (2026).

⁴⁴ Cooley (2012).

the newly independent republics the central danger was not competition as such but the substitution of one hegemonic dependency for another. Three vectors of external influence can be distinguished.

1. Russia retains residual structural leverage: the CAPS still operates in parallel with Russia's unified energy system (UES) through Kazakhstan's grid operator (KEGOC), Moscow promotes a common electricity market through the Eurasian Economic Union, and it has repeatedly offered to finance the region's upstream mega-dams, including Rogun in Tajikistan and Kambarata in Kyrgyzstan.
2. China is the ascendant vector, expanding its presence through gas pipelines, Belt and Road Initiative (BRI) and, increasingly, the critical minerals on which the global energy transition depends, the dimension that Vakulchuk and Overland identify as the region's overlooked strategic significance.⁴⁵
3. The European Union, the United States, Iran and Turkey pursue narrower interests in the diversification of supply and transit; Iran matters concretely as the route through which Turkmenistan exited the CAPS in 2003.

The analytical point is that balancing among these patrons, the multi-vector foreign policy pioneered in Kazakhstan and adopted, in varying degrees, across the region, is itself a sovereignty strategy. By refusing exclusive alignment and playing external powers against one another, the Central Asian states convert their position between competing blocs into a source of leverage rather than subordination.

2.5.3 The water-energy nexus as the internal geopolitical fault line

If external competition is one axis of the sovereignty problem, the water-energy nexus is the other, and it runs directly among the five states. The structural interdependence is stark: the upstream states, Kyrgyzstan and Tajikistan, control the overwhelming majority of the region's water on the order of ~80% but lack fuel and need power in winter, whereas the downstream states, Uzbekistan, Kazakhstan and Turkmenistan, hold the hydrocarbons but depend on summer releases of water for irrigated agriculture. Under Soviet management this asymmetry was coordinated through the seasonal water-for-fuel barter described in Section 2.4; once Moscow's coordination was withdrawn, it became a sovereignty contest.

The upstream mega-dams crystallise the conflict. Projects such as Rogun and Kambarata are, from the upstream perspective, bids for energy autonomy, the physical means to convert water into year-round domestic power. From the downstream perspective, and most vocally under Uzbekistan's President Karimov, they represented a threat to the water on which downstream agriculture and populations depend, and thus a competing sovereignty claim over a shared resource. The dispute is compounded by an ecological dimension. The desiccation of the Aral Sea,⁴⁶ the legacy of the Soviet cotton-irrigation regime, stands as the starkest evidence that the region's water cannot support unlimited extraction; and the recent construction of Afghanistan's Qosh-Tepa canal, which diverts the Amu Darya, introduces a powerful actor that lies outside every existing water-allocation institution.

It is for this reason that the wider scholarly literature increasingly frames the region through a water-energy-food nexus, in which the three systems are analysed as a single interdependent whole rather than as separate sectors. For the argument of this thesis the implication is clear: water and ecology are not external to energy sovereignty in Central Asia; they are its material substrate.

⁴⁵ Vakulchuk and Overland (2019).

⁴⁶ Micklin (2007).

2.6 Discussion

This literature review has traced the historical trajectory of energy governance in Central Asia, moving from the theoretical conceptualization of energy sovereignty to the structural legacy of the Soviet interstate grid and the geopolitical dynamics surrounding its post-1991 evolution. Three core theoretical and empirical insights emerge from this synthesis, highlighting the precise research gap this thesis addresses.

First, the post-Soviet Central Asian experience reveals a fundamental paradox that challenges mainstream policy assumptions. In standard energy literature, energy security and energy sovereignty are frequently treated as complementary, mutually reinforcing imperatives. In Central Asia, however, they have consistently operated as functional substitutes. The initial pursuit of national sovereignty through the physical fragmentation of the shared grid delivered unilateral control at the direct cost of system reliability, a trade-off starkly demonstrated by the region-wide blackout of January 2022.

This dynamic aligns directly with the “*impossible energy trinity*,”⁴⁷ which posits that states participating in cross-border electricity systems cannot simultaneously maximize energy security, environmental sustainability, and national sovereignty. According to this framework, governments must trade one objective against the others, choosing between a “*dirty*,” an “*insecure*,” or a “*non-autonomous*” policy trajectory.⁴⁸ Central Asia’s post-1991 fragmentation represented an explicit turn toward the “*insecure*” path: state leaderships prioritized absolute territorial authority while accepting the systemic fragility, supply shortfalls, and operational inefficiencies that accompanied isolation. The critical theoretical lesson the Central Asian case returns to the broader literature is that security and sovereignty cannot be assumed to align automatically in heavily interconnected infrastructure systems.

Second, the historical record highlights the severe material limits of energy autarky. Sovereignty, defined strictly as absolute self-sufficiency, runs directly into the structural path dependency established during the Soviet-era. Because the regional grid was engineered as a single, interdependent mechanism, full unilateral independence is financially prohibitive and, for hydrologically dependent upstream states, practically unviable in the medium term.

Viewed through this lens, recent reintegration initiatives, such as the 1999 agreement on parallel grid operation, the 2018 reconnection of Tajikistan following the political thaw in Uzbek-Tajik relations, and ongoing proposals for a Eurasian common energy market, do not represent a surrender of state sovereignty. Following the 2018 bilateral agreement and resumption of islanded power trade with Uzbekistan, Tajikistan achieved full synchronous reconnection to the CAPS via Uzbekistan’s southern grid in 2024. Instead, they constitute a move toward a model of pooled or negotiated sovereignty. This reflects Thaler and Hofmann’s “*non-autonomous*” pathway, wherein a state voluntarily cedes a degree of unilateral operational control in exchange for enhanced grid stability, reduced costs, and collective risk-sharing. Crucially, this thesis maintains a clear distinction between the imposed integration of the centralized Soviet command model and the negotiated interdependence chosen by sovereign post-Soviet states which is a distinction that separates voluntary institutional alignment from political subordination.

Furthermore, this framework permits a clear division between the internal and external dimensions of energy sovereignty. Internally, sovereignty concerns a political community’s authority to determine its domestic energy mix, institutional regulations, and resource allocations. Externally, it involves protecting the state against foreign supply disruptions, coercive leverage, and structural subversion by outside powers. This dual distinction reinforces the premise of this thesis: sovereignty is not a

⁴⁷ Thaler and Hofmann (2022).

⁴⁸ Thaler and Hofmann (2022).

binary, static condition (sovereign versus non-sovereign), but a continuous spectrum managed through continuous political and economic trade-offs.

Third, this theoretical synthesis illuminates the specific scholarly gap this thesis occupies. While post-Soviet Central Asian energy has been studied extensively through the analytical lenses of standard energy security and the water-energy-food nexus, it has rarely been examined through energy sovereignty as a standalone primary framework. Reinterpreting the region's historical and contemporary energy dynamics through this lens constitutes the core contribution of this work. The comparative case study of Kyrgyzstan and Uzbekistan in the subsequent chapters illustrates how two states bound by identical Soviet structural inheritances, yet possessing opposite resource endowments, have negotiated the spectrum between autonomy and interdependence along fundamentally different paths.

CHAPTER 3: METHODOLOGY

3.1 Overview of the methodology

This chapter introduces the research questions and outlines the methodology used to address them. Subsequently, it explains the research design and the choice of the two cases, describes the primary and secondary sources the study draws on and the steps by which they are analysed, and closes with the evaluation of those sources, the limits of the approach, and the ethical considerations involved.

3.2 Research questions

The thesis is guided by one overarching question and four subsidiary ones. The central question is

- How has energy sovereignty in Central Asia evolved since the Soviet grid was built, and how have the five republics handled the tension between controlling their own energy and depending on infrastructure they inherited as a single system?

Four narrower questions break this down and follow the structure of the analysis:

1. What did the Soviet energy system bequeath to the region, and how did its collapse in 1991 change the terms on which sovereignty could be claimed?
2. How do the external powers active in the region, mainly Russia, China and the Western/multilateral actors, widen or narrow the room each state has to act?
3. How does the internal division between water-rich upstream states and hydrocarbon-rich downstream states shape competing claims to sovereignty?
4. How do two contrasting states, Kyrgyzstan and Uzbekistan, pursue energy sovereignty in practice, and what accounts for the difference between them?

Addressing these questions supports the central argument of this thesis: energy sovereignty in Central Asia is not an accomplished state of national autonomy, but an ongoing process of managing regional interdependence.

3.3 Research design

This is a qualitative study designed around a comparative historical case study. Its main method is qualitative document analysis, the systematic reading and interpretation of written sources.⁴⁹ The choice follows from the research questions themselves: because they ask how a situation came about and how governments have responded to it over time, they call for an approach that can trace processes and keep context in view, rather than one that isolates variables and measures their effect across a large sample. Energy sovereignty, as Chapter 2 argued, cannot be read off a single indicator. It is a relationship between a state, its resources and the actors around it, and it has to be reconstructed from the historical record. Looking closely at a small number of cases is therefore more useful here than a broad statistical survey.

The analysis proceeded in five steps:

1. Source assembly. Primary documents (intergovernmental agreements, national energy strategies, legislation, official statements) and quantitative data (IEA, World Bank, ADB, UN ESCAP/SPECA) were gathered for the region and for the two case states, and supplemented with scholarly and institutional secondary literature.

⁴⁹ Yin (2018); George and Bennett (2005); Bowen (2009).

2. Source appraisal. Each document was weighed for provenance and purpose, treated as evidence of position rather than neutral fact, and key claims were corroborated across at least two source types before being relied on.
3. Historical reconstruction. The regional system was traced from its Soviet design, through post-1991 fragmentation, to the present, asking at each stage who gained or lost control of energy flows, closer to process tracing than to narrative.
4. Structured, focused comparison. Kyrgyzstan and Uzbekistan were each examined against the same five dimensions drawn from Chapter 2: control over resources, control over infrastructure, exposure to external powers, position in the water-energy nexus, and the shift toward domestically controlled renewables.
5. Cross-case synthesis. The two cases were compared dimension by dimension to identify divergent strategies and shared outcomes, with Kazakhstan, Tajikistan and Turkmenistan used as contextual checks on the pattern.

3.4 Case selection

The comparison is built on contrast. Kyrgyzstan and Uzbekistan were selected because they sit at opposite ends of the structural divide that organises the region's energy politics. Kyrgyzstan is an upstream state whose leverage comes from water and hydropower⁵⁰, while Uzbekistan is a downstream state that built its economy on gas and is now moving into solar and wind.⁵¹

Choosing two cases that differ sharply on this dimension but share the same Soviet inheritance and the same regional grid, makes it possible to see how a common starting point produced divergent strategies. In the language of comparative method this is a most-similar-systems design: the two cases are held alike on their regional context and Soviet inheritance so that the variable of interest, their opposite positions on the water-hydrocarbon divide, stands out.⁵² With only two cases, it is difficult for the design to isolate a single cause, thus it is used here to structure the comparison rather than to prove one. The other three republics, Kazakhstan, Tajikistan and Turkmenistan, are not treated as separate cases. They provide context, since neither of the two chosen states can be understood apart from the energy ring they once belonged to.

3.5 Data and sources

This desk-based study draws its evidence from primary and secondary sources, given that the temporal and regional focus precludes traditional fieldwork.. These sources fall into two categories:

1. Primary sources are the materials the actors produced themselves: the intergovernmental agreements that governed the shared system, among them the 1998 Syr Darya water-and-energy agreement and the 1999 agreement on parallel operation, together with national energy strategies, legislation and official statements, and quantitative data from bodies such as the International Energy Agency (IEA).
2. Secondary sources are the scholarly works that interpret this record and supply both the theoretical framework and much of the empirical detail. Institutional and grey literature from organisations that monitor the sector, including the ADB, the World Bank, APERC and research institutes such as German Institute for International and Security Affairs/Stiftung Wissenschaft und Politik (SWP), sits between the two and is drawn on for evidence and interpretation alike.

⁵⁰ IEA (2022a) and IEA (2020b).

⁵¹ IEA (2020c); UN ESCAP/SPECA (2018).

⁵² Przeworski and Teune (1970); Lijphart (1971); Seawright and Gerring (2008).

Recent developments that postdate much of the academic literature, such as the 2022 regional blackout and the 2025 synchronisation of the Baltic states with the European grid, are taken from reputable reporting and official statements.

3.6 Analytical steps

Two analytical steps organise this material:

1. The first is a historical reconstruction, closer to process tracing than to storytelling, which follows the regional system from its Soviet design through its fragmentation after 1991 to the present, and asks, at each stage, who gained or lost control.⁵³
2. The second is a structured comparison. The two cases are examined against the same set of dimensions taken from the framework in Chapter 2: control over resources, control over infrastructure, exposure to external powers, position in the water-energy nexus, and the move toward domestically controlled renewables. Putting the same questions to both cases keeps the comparison disciplined and stops it from turning into two separate country descriptions.⁵⁴

3.7 Source evaluation, limitations and ethics

Because the analysis rests largely on documents, its reliability depends on how they are read and interpreted. Documents are produced for a purpose and carry the interests of whoever wrote them, so they are treated as evidence of position and commitment rather than as neutral fact. As an example, an intergovernmental agreement shows what states undertook on paper, which is not always what followed in practice. Each source is therefore weighed for who produced it and why, and, where possible, a claim is corroborated across more than one type of source, so that a figure or an event reported in a policy brief is checked against academic or institutional accounts before it is relied on.

Two further constraints should be acknowledged here and are taken up again in Chapter 5. While the author reads Russian and could therefore draw directly on Russian-language documentation, much of the region's primary material exists specifically in Uzbek and Kyrgyz, which had to be approached through translation or Russian-language intermediaries; and to keep the evidence base verifiable for the reader, the study relies where possible on English-language and translated sources. Both factors limit what can be seen. Energy and water data from the region are also uneven and, in some states, shaped by governments with an interest in how the figures look. Reading these sources critically, and being open about the gaps, is part of the method rather than an afterthought.

The study raises no ethical concerns of the kind associated with human participants, since it uses only published material. It does engage with politically charged disputes between states, above all the upstream and downstream claims over shared water, and these competing positions are presented as fairly as the sources allow rather than being settled in advance.

⁵³ Collier (2011); Beach and Pedersen (2013).

⁵⁴ George and Bennett (2005).

CHAPTER 4: RESULTS

4.1 Introduction

This chapter turns from the framework to the evidence and asks a direct question: have Kyrgyzstan and Uzbekistan achieved energy sovereignty, and if not, what are they doing to reach it? The answer developed here is that neither has achieved sovereignty in the sense of autonomy, and that both are pursuing it through a mix of domestic projects and external partnerships that leaves them, for now, more interdependent rather than less. The two cases are examined against the dimensions set out in Chapter 3: control over resources, control over infrastructure, exposure to external powers, position in the water-energy nexus, and the shift toward domestically controlled renewables. Section 4.2 takes each country in turn. Section 4.3 compares them and weighs the regional and external institutions, the Eurasian Economic Union, the Shanghai Cooperation Organisation (SCO) and the newer World Bank backed regional market, that shape what sovereignty can mean in practice.

4.2 Case studies

Before the two cases are examined in depth, Table 5 places them in the wider regional field. It sets each of the five republics against four markers used throughout this chapter: the resource its power system rests on, its current flagship project, its principal external partners, and its position in the shared water-energy system. The table shows why Kyrgyzstan and Uzbekistan make a revealing pair. They sit at opposite ends of the upstream-downstream divide and of the hydro-to-hydrocarbon spectrum, while sharing the same Soviet inheritance and the same set of outside suitors.

Figure 4.1 locates the five republics geographically, orienting the reader to the upstream-downstream geography that organises the region's energy politics.

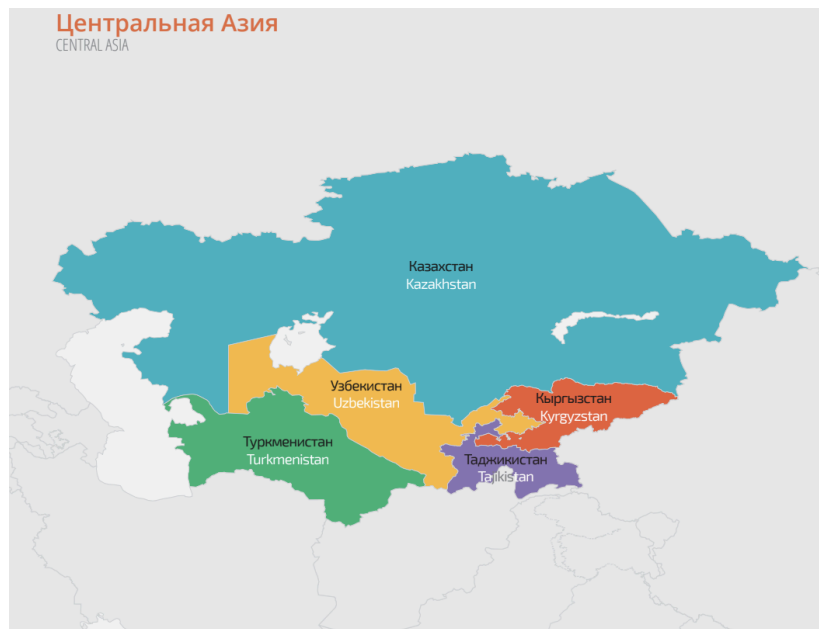


Figure 4.1: Political map of the five Central Asian republics.⁵⁵

⁵⁵ UN ESCAP/SPECA (Energy and Development in Central Asia, p. ii).

Table 5 profiles the five republics against four markers used throughout this chapter: resource base, flagship project, principal external partners, and position in the shared water-energy system, and shows why Kyrgyzstan and Uzbekistan make a revealing pair: they sit at opposite ends of the upstream-downstream divide while sharing the same Soviet inheritance and the same set of outside suitors.

Table 5: Energy profiles of the five Central Asian states⁵⁶

State	Resource base	Flagship project(s)	Main external partners	Water-energy position
Kazakhstan	Coal, oil and gas; major uranium producer	First nuclear plant (Rosatom, ~2.4 GW)	Russia, China	Downstream (Syr Darya)
Kyrgyzstan	Hydropower (>90% of installed generating capacity)	Kambarata-1 HPP (~1,860 MW)	Russia; World Bank/EU; China	Upstream (Naryn / Syr Darya)
Tajikistan	Hydropower (~90% of electricity)	Rogun Dam (~3,600 MW); CASA-1000	World Bank; China; Iran	Upstream (Vakhsh / Amu Darya)
Turkmenistan	Natural gas (major reserves)	Gas exports to China; TAPI pipeline	China (main buyer); Iran	Downstream (Amu Darya)
Uzbekistan	Gas (declining), shifting to solar, wind and nuclear	Renewables (Masdar/ACWA Power); Jizzakh nuclear	Russia; UAE/Saudi Arabia; China	Downstream (Amu / Syr Darya)

4.2.1 Kyrgyzstan

Resource base and the winter paradox. Kyrgyzstan's leverage rests on water. More than 90% of its electricity comes from hydropower, most of it from the Toktogul cascade on the Naryn river, and the country has developed only about a tenth of its hydropower potential.⁵⁷ On paper this makes it energy-rich. In practice it has produced a recurring winter crisis, because hydropower output falls in the cold months, when demand for heating peaks, and a run of low water years has turned shortfall into emergency. In July 2023 the government declared a state of emergency in the energy sector running to the end of 2026, citing falling flows on the Naryn, rising demand and limited generating capacity.⁵⁸ Two figures capture the scale of the problem. The country's annual supply gap stood at around 3 billion kWh in 2023 and, on the Ministry of Energy's warning, could widen to 5-6 billion kWh by 2026 without rapid capacity additions; within that total, the acute winter heating deficit alone is projected at roughly 4.1 billion kWh.⁵⁹ Both are covered in the meantime by winter imports from Kazakhstan, Uzbekistan, Turkmenistan and Russia.⁶⁰

Dependence on external suppliers. The winter gap is only part of the story. Kyrgyzstan imports all of its oil and gas, and its gas network has been owned since 2013 by Russia's Gazprom, which bought it for a symbolic sum and committed to invest in its expansion.⁶¹ This leaves a single foreign supplier

⁵⁶ Compiled from IEA country profiles.

⁵⁷ IEA (2022a), Kyrgyzstan; IEA (2020b), Kyrgyzstan energy profile.

⁵⁸ Presidential Decree No. UP-178 (2023).

⁵⁹ Argumenty i fakty (2026).

⁶⁰ Kwan (2025).

⁶¹ IEA (2020b), Kyrgyzstan energy profile.

in the country's gas system, for the moment. More recently the search for winter baseload has drawn Kyrgyzstan toward Russian nuclear power. Under a 2022 memorandum with Rosatom, Bishkek has moved toward installing a Russian small modular reactor (SMR) of the RITM-200N type to stabilise supply.⁶² Such a plant would ease winter shortages but deepen Kyrgyzstan's technological partnership with Moscow thus covering energy independence, localized production and technical training. So that the country appears to trade one form of vulnerability for another. It is worth noting, however, that this cooperation also extends to a renewable-energy partnership, which represents a step toward energy sovereignty. In December 2024, JSC "Rosatom Renewable Energy" and the Cabinet of Ministers of Kyrgyzstan signed an investment agreement to build the country's first 100 MW wind farm in the village of Kok-Moinok, Issyk-Kul Region, which will generate approximately 280 million kWh of green energy per year.⁶³ The pursuit of security, in other words, pulls against the pursuit of sovereignty, exactly the tension set out in Chapter 2.

Kambarata-1 as a sovereignty project. The centrepiece of Kyrgyzstan's bid for energy independence is the Kambarata-1 hydropower plant (HPP) on the upper Naryn river, upstream of the existing Kambarata-2 plant and the Toktogul reservoir. In the World Bank's account it will be a greenfield dam about 256 metres high, holding a reservoir of 5.4 billion cubic metres, with a design capacity of about 1,860 megawatts (MW) and annual output of some 5,600 gigawatt-hours (GWh)-close to half of the country's present electricity supply, and enough in principle to close the winter gap and turn Kyrgyzstan into an exporter.⁶⁴ Construction was launched in 2022, with the first unit planned for 2028.⁶⁵

The case for it is the winter deficit. Hydropower supplies the overwhelming majority of Kyrgyz electricity-roughly 90% of installed generating capacity, and between about 86% and 90% of actual generation depending on the water year, with thermal plants and seasonal imports covering the remainder in low-inflow winters. Demand has grown by roughly 70% since 2010 with no major new plant added, and the winter shortfall now runs at about a fifth of annual demand, met by emergency imports at high prices. By producing power through the winter, Kambarata-1 is meant to close that gap, leave a surplus to export, and provide the flexible output needed to balance future solar and wind.

What makes the project significant for the argument here is less its scale than the way it is being financed and owned. In June 2024, Kyrgyzstan, Kazakhstan and Uzbekistan signed a ministerial agreement to develop, finance and operate the plant jointly, under a joint public-financing approach coordinated by an intergovernmental working group, with a regional joint-venture company to be created to own and run it; reporting on the shareholding gives the Kyrgyz side 34% and the two downstream states 33% each.⁶⁶ The World Bank states the logic of the arrangement plainly: joint development reduces the fiscal burden on Kyrgyzstan, whose share of the project cost approaches 30% of its GDP, and lets the financing be raised on the stronger sovereign credit ratings of Uzbekistan and Kazakhstan, while export power-purchase agreements underwrite the commercial case. In effect, Kyrgyzstan borrows on its neighbours' creditworthiness and sells them the power in return.

The financing at this scale comes largely from outside the region. At Kyrgyzstan's request the World Bank is acting as lead arranger, with an indicative commitment of around 1.5 billion dollars across three phases, 500 million of it for the first, and in 2024 it convened a donor coordination committee of other lenders, among them the ADB, the Asian Infrastructure Investment Bank (AIIB), the European Investment Bank (EIB), the European Bank for Reconstruction and Development (EBRD),

⁶² Komsomol'skaya pravda (2026).

⁶³ Rosatom Renewable Energy (2024).

⁶⁴ World Bank (2025c), Project Information Document; World Bank (2025b), Kambarata-1 HPP programme page.

⁶⁵ International Network of Basin Organizations (2025).

⁶⁶ World Bank (2025c), Project Information Document.

the European Union (EU) and the Organization of the Petroleum Exporting Countries (OPEC) Fund. The full construction cost is far larger, reported at around 4 billion dollars. The project is not without cost at home, either: it is rated a high environmental and substantial social risk, will inundate a stretch of the Naryn behind the dam and require resettlement and a workforce peaking near 3000, and it triggers the World Bank's safeguard on international waterways because the river is shared with downstream states.⁶⁷ The irony is instructive. The stated development objective of Kyrgyzstan's flagship sovereignty project is, in the World Bank's own words, to strengthen regional energy-water cooperation. Kambarata-1 HPP is a national bid for autonomy pursued through regional co-ownership and interregional cooperation. It is sovereignty sought through interdependence, and it compresses into a single project the argument this thesis has made.

Domestic renewables and strategy. Beyond the mega-dam, Kyrgyzstan's plans lean on more hydropower and, more slowly, on solar and wind. The National Strategy and successive energy programmes support a cascade of smaller plants, including the Kazarman and Upper Naryn projects⁶⁸ and roughly a hundred small hydropower stations, while the clean-energy targets presented by the government aim for a modest 5% of generation from solar and wind by 2030 and a fully renewable mix by 2050.⁶⁹ Solar and wind remain marginal for now, and the near-term reality is continued reliance on hydropower and imported power.

4.2.2 Uzbekistan

From gas exporter to gas importer. Uzbekistan begins from the opposite position. Its energy system was built on natural gas, which still fuels the bulk of its thermal power, and for decades the country was a gas exporter. That position has reversed. Falling output and rising domestic demand turned Uzbekistan into a net gas importer, and from 2023 it began buying Russian gas piped through Kazakhstan, a striking change for a former exporter.⁷⁰ The erosion of its gas base is one of the main forces pushing Uzbekistan toward renewables and nuclear power.

The renewable build-out. Uzbekistan's turn to renewables is anchored in law: the Strategy for the Transition to a Green Economy for 2019-2030, adopted by presidential decree in 2019, the Concept Note for ensuring electricity supply in 2020-2030, and a Law on the Use of Renewable Energy Sources and a Law on Public-Private Partnership of the same year that opened the sector to private and foreign investors. The Green Economy strategy set broad aims, a doubling of energy efficiency and lower emissions per unit of GDP, while the Ministry of Energy fixed a capacity target of 7 GW of solar and 5 GW of wind by 2030, part of a wider goal of at least 25 GW of renewable capacity and of renewables supplying between a quarter and 40% of electricity, alongside a hydropower programme aiming at 6 GW; in January 2025 the target for the renewable share was raised again, to 50%.⁷¹ The IEA's roadmap, which sets a path to 5 GW of solar and a 25% renewable share by 2030, is a measure of how far this reaches: as recently as 2022 solar and wind together supplied only about 1% of a total generating capacity of roughly 14 GW, some 86% of which was thermal.⁷²

The scale-up since has been rapid, and it is delivered almost entirely by foreign investors. The first utility-scale solar plant, 100 MW at Nur Navoi, was commissioned by the Emirati company Masdar in 2021; by late 2024 nine solar plants and the country's first commercial wind farm, Masdar's 500 MW Zarafshan project, were in operation, and solar and wind had together generated some 4.2 billion kWh, displacing well over a billion cubic metres of gas.⁷³ Masdar has since inaugurated the

⁶⁷ World Bank (2025a), Draft Environmental and Social Impact Assessment.

⁶⁸ Cabinet of Ministers of the Kyrgyz Republic (2026).

⁶⁹ World Bank (2024).

⁷⁰ Bland (2026).

⁷¹ President of the Republic of Uzbekistan (2019); Republic of Uzbekistan (2019); UNECE (2025).

⁷² IEA (2022b), Solar energy policy in Uzbekistan; IEA (2020c), Uzbekistan energy profile.

⁷³ ESG News (2025).

country's first solar-and-battery plant, at Nur Bukhara, and broken ground on the Guzar plant, while Saudi Arabia's ACWA Power is building a series of large wind farms, among them Bash and Dzhanakeldy at 500 MW each and the 1.5 GW Kungrad project; French and Chinese firms, including Total Eren, Volitalia, Gezhouba and China Datang, hold further contracts. These plants are financed, built, owned and operated by the investors, which sell the electricity to the state grid under long-term purchase agreements, and the programme as a whole, put at more than 20 billion dollars, is funded by foreign direct investment. The grid upgrades needed to absorb this new capacity are themselves financed largely by the World Bank and the ADB, and the system still leans on its gas plants for the flexibility that intermittent solar and wind require.⁷⁴ The resource is domestic; the generating assets, for the most part, are not.

The Parkent furnace and the limits of heritage. Uzbekistan's association with solar power is older than these projects. Near Parkent, east of Tashkent, stands the Big Solar Furnace, commissioned in 1987 and still the world's second-largest after its twin at Odeillo in France. Its field of more than 10,000 mirrors concentrates sunlight to temperatures above 3000 degrees Celsius.⁷⁵ The furnace is often invoked as evidence of a deep, Soviet rooted solar-science heritage, and it remains a working research centre. It is worth being clear about what it is, however. The furnace is a 1 MW thermal installation used to melt and test materials, not a power station that feeds the grid. It cannot be scaled up to meet an electricity target: even treated naively as a 1 MW unit, the country's multi-gigawatt solar and wind ambitions would correspond to many thousands of such installations, and in reality they rest on an entirely different technology, utility-scale photovoltaics and wind turbines supplied from abroad. The Parkent furnace is a symbol of scientific pedigree rather than a building block of the energy strategy, and the distance between the two captures Uzbekistan's position: the heritage is domestic, the modern capacity is foreign-built.

Nuclear power and the Russian anchor. The other pillar of Uzbekistan's plan is nuclear power. In May 2024 the country signed the world's first export contract for a SMR plant, under which Rosatom will build six RITM-200N reactors of 55 MW each, about 330 MW in total, in the Jizzakh region.⁷⁶ In 2025 the project was enlarged to add two large VVER-1000 reactors, bringing the planned complex to roughly 2.3 GW, with construction under way and the first units expected toward the end of the decade.⁷⁷ Uzbekistan has also signed a memorandum with China National Nuclear Corporation (CNNC) on reactor and uranium cooperation, and it holds its own uranium reserves.⁷⁸ Nuclear power promises firm, low-carbon supply, but it ties Uzbekistan's energy future to Russian technology, fuel and financing for decades.

4.3 Other states in the region

The paired comparison does not exhaust the region's landscape. The three remaining republics: Kazakhstan, Tajikistan and Turkmenistan, each pose the sovereignty question in a distinct structural register, ultimately validating the core pattern identified in the focal cases: across Central Asia, sovereignty is pursued not through autarkic withdrawal, but through the deliberate management of interdependence.⁷⁹ Against a shared baseline of universal legacy grid access and stark hydro-hydrocarbon divides, each state demonstrates that domestic resource control is structurally tethered to cross-border engagement.

⁷⁴ OECD (2025); IEA (2022b), Solar energy policy in Uzbekistan.

⁷⁵ Archenerg Cluster, (n.d.).

⁷⁶ Gazeta.uz (2026); World Nuclear News (2024).

⁷⁷ World Nuclear News (2025).

⁷⁸ CNNC (2024).

⁷⁹ UN ESCAP/SPECA (2018).

Kazakhstan is the region's largest economy and energy producer, resting on coal, oil and gas and on its position as the world's leading uranium producer, with roughly 40 per cent of global output.⁸⁰ It is also the structural anchor of the shared grid, since CAPS operates in parallel with Russia's UES through the KEGOC, and it is the acknowledged pioneer of the multi-vector foreign policy adopted across the region (Section 2.5.2). Yet hydrocarbon wealth has not spared it the region's paradox. A coal-heavy fleet and chronic capacity pressure have pushed Astana toward its flagship project, a first nuclear power plant: following a referendum in October 2024 in which some 71% of voters gave their assent, in June 2025 Kazakhstan selected Russia's Rosatom to lead the construction consortium. Ahead of China's CNNC, France's Électricité de France (EDF) and South Korea's Korea Hydro and Nuclear Power (KHNP), for a plant of two VVER-1200 reactors, about 2.4 GW, to be built at Ulken on Lake Balkhash and to enter service in the mid-2030s, with a planned second plant earmarked for China's CNNC.⁸¹ The choice reproduces Uzbekistan's dilemma almost exactly: a hydrocarbon power converting to low-carbon baseload by importing foreign, mainly Russian, technology, while hedging multi-vector by parcelling later capacity to a second patron. And as a downstream state on the Syr Darya, a 33% co-owner of Kambarata-1 and a party to the 2025 water barter, Kazakhstan is already woven into the Kyrgyz case examined above.

Tajikistan is the structural twin of Kyrgyzstan. An upstream, hydro-dominant state, some 90% hydropower, subject to the same winter deficits, and its sovereignty bid takes the same form, only larger and more precarious.⁸² The Rogun Dam, begun under the USSR in 1976 and relaunched in 2016 with Italy's Webuild, is designed to be the world's tallest at 335 metres and to generate 3,600 MW; two units have run since 2018-2019, but the structure stands at roughly half its planned height and completion is estimated at some 6.4 billion dollars, close to 40% of GDP.⁸³ Here the dependence is fiscal and multilateral: the World Bank approved a 350-million-dollar grant in late 2024 but paused further support in 2025 pending a credible debt-financing plan, firm export contracts and dam-safety assurances,⁸⁴ while the CASA-1000 line, its converter stations completed in 2025, is meant to carry summer surplus to Afghanistan and Pakistan, with Kazakhstan lined up as a further buyer.⁸⁵ Reconnected to CAPS through Uzbekistan after the 2018 thaw (Section 2.4.3), Tajikistan thus pursues autonomy through exactly the instruments, external finance and export markets, that bind it more tightly to others, and it is here, in the transboundary friction over Amu Darya flows, that security, sovereignty and the water-energy nexus collide most sharply.

Turkmenistan is the outlier, and for that reason the most instructive. The most gas-rich of the five, holding the giant Galkynysh field, it withdrew from CAPS in 2003 and has since run an isolated national grid, historically in parallel with Iran (Section 2.5.1). Internally this is the closest the region comes to sovereignty as autonomy: a state monopoly over an autarkic system, answerable to no shared dispatch. Externally, however, it is the most dependent of all. Roughly 90% of its gas exports flow to China through the three lines of the Central Asia-China pipeline, making Beijing a near-monopsony buyer;⁸⁶ the long-promised fourth line, Line D, remains stalled, the Turkmenistan-Afghanistan-Pakistan-India (TAPI) route has languished for three decades despite work beginning on its Serhetabat-Herat section in late 2024, the Trans-Caspian corridor to Europe is still blocked, and the prospect of Russia's Power of Siberia-2 threatens to crowd out Turkmen volumes altogether.⁸⁷ Turkmenistan is thus the control case for this thesis's central claim: the state that most completely fragmented the grid to assert autonomy achieved precisely that at home, only to

⁸⁰ IEA (2020a), Kazakhstan energy profile; World Nuclear Association (2026).

⁸¹ World Nuclear Association (2026); NucNet (2025).

⁸² IEA (2022c), Tajikistan.

⁸³ Eurasianet (2025); Times of Central Asia (2025a).

⁸⁴ World Bank (2023); Eurasianet (2025).

⁸⁵ Interfax (2025).

⁸⁶ The Diplomat (2026); Eurasianet (2026).

⁸⁷ Times of Central Asia (2025b); The Diplomat (2026).

convert internal autonomy into external subordination to a single patron. Autonomy, its case shows, is not sovereignty; sovereignty inheres in the terms of dependence, and Turkmenistan holds the weakest terms precisely because it declined to diversify.

Across all three, then, the same finding recurs that the focal comparison isolates: control at home is inseparable from the terms of engagement abroad, and the states that fare best are not those that seek autarky but those that keep several patrons in play.

4.4 Comparative assessment

The broader regional context consolidates this empirical baseline. Kazakhstan reproduces Uzbekistan's trajectory of deploying Russian-built nuclear capacity to offset fossil constraints; Tajikistan extends Kyrgyzstan's upstream reliance on capital-intensive mega-dams under heightened structural risk; and Turkmenistan illustrates the boundary condition where absolute grid isolation culminates in external trade vulnerability. Set against these cases, Kyrgyzstan and Uzbekistan are systematically compared across the theoretical dimensions established in Chapter 3.

And, the following points can be made:

- Two routes, one pattern: The two states approach sovereignty from opposite resource endowments and yet arrive at a similar condition. Kyrgyzstan is trying to convert upstream water into firm domestic power through Kambarata-1 while leaning on Russian gas and, increasingly, Russian nuclear technology to survive the winter. Uzbekistan is trying to replace a declining gas base with foreign-built renewables and a Russian-built nuclear plant. In both cases the resource, water or sunlight, is domestic, but the capital, the technology and often the ownership of new generations are external. Neither country has achieved energy sovereignty understood as autonomy; both are pursuing it through interdependence, regional and global.
- Diversifying patrons: What keeps this interdependence from collapsing into simple dependence is the range of partners now in play, which lets both states practise the multi-vector strategy described in Chapter 2. Russia remains central through gas, grid connections and nuclear power. China is the largest source of investment in the region, working mainly through the BRI, grid and transmission projects, the Central Asia-China gas pipelines and the China-Kyrgyzstan-Uzbekistan railway, and at the 2025 SCO summit in Tianjin it pledged to build 10 gigawatts of solar and 10 gigawatts of wind across member states. The Gulf states, through Masdar and ACWA Power, dominate Uzbekistan's renewable programme, while Western and multilateral institutions anchor Kambarata-1 and the emerging regional market. Playing these off against one another is itself the sovereignty strategy: no single patron holds all the cards.
- Competing frameworks of integration: The institutional layer reflects the same contest. Kyrgyzstan is a member of the Russian-led Eurasian Economic Union, which has long promised a common electricity market, while Uzbekistan has kept its distance as an observer rather than a full member. Alongside and in tension with the EAEU sits a Western-backed alternative: in January 2026 the World Bank approved a Regional Electricity Market Interconnectivity and Trade programme (REMIT), described as Central Asia's first regional electricity market, with Kyrgyzstan, Uzbekistan and Tajikistan and the Tashkent dispatch centre in its first phase. The SCO adds a third, looser platform, useful to China as an umbrella for investment and corridor security rather than as an energy market in its own right. Sovereignty here is exercised by choosing among overlapping clubs, not by standing outside them.
- The water-energy nexus, revived: The oldest form of interdependence has also returned. In late 2025, with the Toktogul reservoir low, Kazakhstan, Kyrgyzstan and Uzbekistan agreed

that Kyrgyzstan would hold back water for downstream irrigation through the 2026 season in exchange for electricity supplied by its neighbours over the winter. This is the Soviet-era water-for-power barter in a new, negotiated form, and Kambarata-1, jointly owned by the upstream and downstream states, is designed to give it a permanent institutional shape. The nexus that once bound the republics together under Moscow's management is being rebuilt, this time by the states themselves.

- Answering the question: Did Kyrgyzstan and Uzbekistan achieve energy sovereignty? On the evidence, not yet, and perhaps not in the strong sense at all. Each has taken real steps to command its own energy future, Kambarata-1 and a renewables-and-nuclear programme being the clearest, but each remains dependent on outside technology, capital and, in winter, on imported power, and Kyrgyzstan's near-term path arguably deepens its reliance on Russia even as it builds toward autonomy. What both cases show is sovereignty pursued as the management of interdependence rather than escape from it, which is the reading this thesis has defended throughout.

Table 6 draws the two cases together across the dimensions set out in Chapter 3, summarising how Kyrgyzstan and Uzbekistan, from opposite resource endowments, converge on a shared strategy of managed interdependence rather than autonomy.

Table 6: Comparative assessment of energy sovereignty pathways

Dimension	Kyrgyzstan	Uzbekistan	Comparative Summary and Pattern
Core Strategy and Resource Base	Converting upstream water into firm domestic power via Kambarata-1	Replacing the declining domestic gas base with foreign-built renewables	Two routes, one pattern: both leverage domestic resources
Key Patrons and Partners	Russia, China and Western/multilateral	Russia, Gulf States, China and Western/multilateral	Diversifying patrons: multi-vector strategy
Institutional Framework	Regional Electricity Market (REMIT, 2026) ⁸⁸ , and member of SCO	Observer in EAEU; core participant in REMIT	Competing frameworks: sovereignty exercised by choosing among overlapping clubs
Water-Energy Nexus	Agreed to hold back water in Toktogul for downstream irrigation (2025 barter) ⁸⁹	Receives water for irrigation in exchange for winter electricity (2025 barter)	Revived interdependence: Soviet-era water-for-power barter returns in negotiated form
Overall Assessment	Not achieved in a strong sense- near-term path arguably deepens reliance on Russia even while building toward autonomy.	Not achieved in a strong sense-remains dependent on foreign technology and capital, though reducing gas dependency.	Neither has achieved full autonomy. Both pursue sovereignty as management of interdependence rather than escape from it.

⁸⁸ World Bank (2026a), REMIT project profile; World Bank (2026b), press release.

⁸⁹ 24.kg (2026).

4.5 A novel view of energy sovereignty vs energy security

The evidence assembled in this chapter permits a reformulation of the relationship between energy security and energy sovereignty, and it is here that the contribution of this thesis is at its sharpest. In the mainstream policy literature the two are treated as complementary, even mutually constitutive: a state that secures its supply is presumed thereby to strengthen its sovereign standing. The Central Asian record inverts that assumption. As Section 2.5 showed and the cases confirm, the region's first post-Soviet impulse was to assert sovereignty by physically fragmenting the shared grid. Turkmenistan's exit in 2003 and Uzbekistan's in 2009; the price of that assertion was paid in security, most starkly in the cascading blackout of January 2022. In practice, sovereignty and security functioned not as allies but as substitutes. The pursuit of greater autonomy came at the direct expense of system security.

This is more than a regional case. It gives empirical evidence to Thaler and Hofmann's "*impossible energy trinity*," which holds that states in cross-border electricity systems cannot simultaneously maximize security, sustainability and sovereignty, and must instead trade one against the others.⁹⁰ Central Asia's fragmentation was an explicit turn toward the trinity's "insecure" corner, in which territorial control was bought at the cost of reliability. But the thesis's novel move is to show that this trade-off is not fixed, and that where it appears to bind, the binding is an artefact of how sovereignty is conceived. If sovereignty is read as autonomy, the maximisation of self-sufficiency, then it does indeed stand opposed to security in an interconnected system, because the very interconnection that delivers reliability is what autonomy demands be severed. If, however, sovereignty is read along the spectrum proposed in Section 2.2.7, from autonomy at one pole to negotiated interdependence at the other, then the opposition dissolves at the interdependent end, and security and sovereignty can be recoupled.

The decisive variable, on this reading, is not the quantity of a state's dependence but its terms. Three tests distinguish sovereign interdependence from subordination, and the cases supply each.

1. Whether integration is chosen or imposed: the thesis insists throughout on the distinction between the Soviet command model, in which integration was an instrument of external control, and the post-Soviet agreements, the 1999 parallel-operation accord, the REMIT market of 2026, the joint ownership of Kambarata-1, in which sovereign states voluntarily pool a measure of unilateral control for collective gain.
2. Whether dependence is diversified or monopolised: the multi-vector strategy that keeps Russia, China, the Gulf states and the multilateral lenders simultaneously in play converts a web of dependencies into a portfolio of choices, whereas Turkmenistan's near-total reliance on a single buyer shows what undiversified dependence costs.
3. Who sets the rules and captures the rents: sovereignty survives interdependence so long as the state retains authority over the terms such as the pricing, the shareholding, the market design, and even where it does not own every asset.

Judged by these tests, the region's trajectory is legible as a movement along the spectrum rather than a failure to reach its autonomous pole. The fragmentation of the 1990s and 2000s sat near autonomy, and forfeited security accordingly; the negotiated interdependence now taking shape; co-owned dams, a rule-based regional market, the revived water-for-power barter of 2025. It sits nearer the interdependent pole, and recovers security without surrendering control, because the integration is voluntary, diversified and rule-bound. In Cherp and Jewell's terms, the sovereignty and robustness

⁹⁰ Thaler and Hofmann (2022).

perspectives, which diverged after 1991, are being brought back into alignment;⁹¹ in Thaler and Hofmann's, the trilemma is not escaped but softened, its forced choice between "*dirty*", "*insecure*" and "*non-autonomous*" relaxed by a fourth disposition the binary framing cannot see, a managed interdependence that trades a portion of formal autonomy for a recovery of both security and effective control.⁹²

The novel view this thesis defends can therefore be stated compactly. In densely interconnected energy systems, energy sovereignty is not the degree of a state's autonomy but its capacity to govern the terms of its interdependence, and its proper measure is not how little a state depends on others but how diversified, how voluntary and how rule-bound those dependencies are. On that measure, security and sovereignty cease to be substitutes and become, once more, capable of being pursued together. Which is precisely the condition Kyrgyzstan and Uzbekistan, from opposite starting points, are now feeling their way toward.

⁹¹ Cherp and Jewell (2014).

⁹² Thaler and Hofmann (2022).

CHAPTER 5: CONCLUSIONS

5.1 Summary and conclusions

This thesis set out to trace the historical evolution of energy sovereignty in Central Asia and to ask whether the region's states have achieved it. The argument has been considered from the Soviet inheritance, through the fragmentation of the 1990s and 2000s, to the uneven re-coordination of the present, and has been tested against two contrasting cases. Its central finding is that energy sovereignty in the region is best understood as the management of interdependence rather than the achievement of autonomy. Kyrgyzstan and Uzbekistan have both taken real steps to command their own energy, but both remain bound to outside technology, capital and, at times, imported power, and their most ambitious national projects are pursued through regional cooperation and external finance.

The central question asked how energy sovereignty in Central Asia has evolved and how the five republics have handled the tension between controlling their own energy and depending on inherited infrastructure; the answer, defended throughout, is that sovereignty here is the management of interdependence rather than the achievement of autonomy. The four subsidiary questions can now be answered in turn, and together they substantiate that claim.

The first asked what the Soviet system bequeathed and how its collapse changed the terms of sovereignty. The answer, developed in Chapter 2, is that the region inherited a single integrated machine, built to be run from one centre and balanced by a seasonal exchange of water for fuel. When that centre vanished in 1991, the shared system became a field of contested national claims, and the very integration that had made the republics function became the thing each of them tried to escape.

The second question asked how external powers widen or narrow each state's room to act. Chapters 2 and 4 showed a broad field of partners: China through investment, pipelines and the BRI; the Gulf states through renewable projects; Western and multilateral lenders through the financing of dams and a regional market; and Russia through the institutions of post-Soviet cooperation, the shared grid inherited from the Soviet period, the Eurasian Economic Union's common electricity market, the SCO, and the supply of gas and nuclear technology. The room to act comes from this plurality. By engaging several partners at once, a multi-vector approach pioneered in Kazakhstan and now common across the region, the states turn a web of dependencies into a measure of choice.

The third question asked how the upstream-downstream divide drives competing sovereignty claims. The water-energy nexus, examined in Chapter 2 and again in Chapter 4, remains the region's sharpest internal fault line, while it has also become the clearest site of negotiated interdependence. The revived water-for-power arrangements of 2025 and the joint ownership of Kambarata-1 by upstream and downstream states show the old Soviet barter being rebuilt, this time by the states themselves rather than by Moscow.

The fourth question asked how Kyrgyzstan and Uzbekistan pursue sovereignty and what explains the difference between them. Chapter 4 answered the first part in detail and, in doing so, provided an answer to the second. The two states diverge because their resource endowments diverge: Kyrgyzstan's upstream water pushes it toward a hydropower mega-project and a winter import problem, while Uzbekistan's declining gas pushes it toward foreign-built solar, wind and nuclear. Yet the same structural inheritance drives both toward the same solution, reliance on outside capital and technology, so that opposite starting points converge on a shared condition of interdependence. That convergence, produced by a common inheritance acting on opposite endowments, is exactly what the most-similar systems design was built to reveal.

It is worth being explicit about what would have counted as sovereignty achieved, so that the finding is not merely a matter of definition. A state that had reached energy sovereignty in the strong sense would meet its own demand from resources it controls, own and operate its generating assets, set the terms of supply without deference to an external partner, and avoid reliance on any single foreign supplier for a critical input. On these measures neither case qualifies. Kyrgyzstan cannot yet meet its own winter demand and remains closely tied to Russia for gas and, increasingly, for the nuclear technology meant to close its deficit; Uzbekistan is exchanging one set of dependencies for another, in foreign-owned renewables and a Russian-built nuclear plant. Measured against a clear standard, the cases fall short, and the shortfall is what gives the thesis its argument. The contribution is to read Central Asia's energy history through the sovereignty framework rather than the more familiar lenses of energy security or the water-energy-food nexus, and to show that in this region security and sovereignty, usually treated as allies, have often behaved as rivals.

5.2 Limitations and recommendations

Several limitations qualify these conclusions. The study rests on two cases, chosen for their contrast, and its findings are meant to illuminate the region's logic rather than to be generalised mechanically to every state; a design built for depth pays for it in breadth. It relies on secondary and documentary sources, many of them recent and some produced by governments or investors with an interest in how they appear, and it works mainly from English-language and translated material, which limits access to national and local detail. The subject is also moving quickly, and several developments shifted even over the course of writing: Kazakhstan selected Rosatom to build its first nuclear plant in June 2025 (NucNet, 2025), Uzbekistan raised its renewable-share target to 50% in January 2025 (UNECE, 2025), and the World Bank approved the REMIT regional electricity market in January 2026 (World Bank, 2026b). Some of the figures used here will therefore date.

These limits point to useful further work. The framework applied here to Kyrgyzstan and Uzbekistan could be extended to the three states treated as context, Kazakhstan, Tajikistan and Turkmenistan, each of which poses the sovereignty question differently: through uranium and a first nuclear plant, through the Rogun mega-dam, and through gas exports to China. Fieldwork and interviews with officials, plant operators and affected communities would add the national and local texture that documentary analysis cannot reach, and would open the internal, community-level dimension of energy sovereignty that this thesis set aside. The ownership question raised by Uzbekistan's foreign-built plants, whether a state that hosts but does not own its generation can be said to be sovereign over it, deserves closer study, as does the relationship between the Eurasian and Western-backed frameworks of regional integration now taking shape. Following whether the region's negotiated interdependence hardens into stable cooperation or slips back toward fragmentation is the natural next task, and one the coming decade will decide.

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