



Review

Oil, labor, and the fraying social contract: a review of energy justice and future energy transition in Trinidad and Tobago

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ABSTRACT

This review explores the history of Trinidad and Tobago's hydrocarbon sector through the lens of energy justice. The unresolved issue in Trinidad and Tobago, as in many petro states, is achieving a democratic transition that genuinely includes affected people. Energy justice is the starting point for sustainable transition. It considers future energy systems, decarbonization, and sustainable policies. Drawing on peer-reviewed literature, government archives, and comparative studies with other nations, the review covers 169 years of oil and gas, from the first drilled Merrimac well in 1857 to current plans for cross-border gas cooperation with Venezuela and a 30% renewable-energy electricity target by 2030. Adopting a three-level energy justice approach of distributional, procedural, and recognition justice, the paper analyses four events: the 1937 labor unrest, OWTU campaigns (1960-1985), the Alutrint case, and the Petrotrin refinery closure in 2018. The study finds a degradation of the extractive social contract: a weaker state-citizen relationship driven by rent-based governance rather than democratic accountability. Unlike Norway, Nigeria, Venezuela, Alaska, and Scotland, Trinidad and Tobago is characterized by procedural and recognition justice problems of distressed petro-states rather than transition countries. This paper proposes a new social contract model that emphasizes participatory energy governance, transparent benefit distribution, planning for a just transition and energy democracy, and a path to decarbonization through 2065. In accordance with PRISMA 2020, the paper employs the Scopus, Web of Science, JSTOR, Google Scholar, and UWI Library Repository databases, analyzing 61 documents out of 1256. The key innovation lies in combining historical political economy with future-oriented policy, connecting energy justice diagnostics to practical institutional reforms, and overcoming political economy obstacles that have prevented reforms in Trinidad and Tobago.

1. Introduction

It is not widely recognized that Trinidad and Tobago began commercial petroleum extraction in 1857 [1], a full two years before Edwin Drake's celebrated Pennsylvania strike in 1859 [2]. Despite this chronological precedence, documented in the Geological Society's archives in Port of Spain, the country has registered only marginally in global energy historiography. Trinidad and Tobago belongs, in a literal sense, among the opening chapters of the global history of oil. Over the century and a half that followed, hydrocarbons came to define the country's fiscal architecture, its social geography, its labor relations, and the terms on which successive governments negotiated legitimacy with citizens.

The corridor extending south from San Fernando toward Point Fortin encompasses communities whose social infrastructure (schools, churches, and recreational grounds) developed around the expectation of indefinitely continued petroleum production. The processes through which this dependency developed have been examined over the past decade through research combining energy system modeling with EnergyPLAN [3], policy advisory work on renewable energy for the Government of Trinidad and Tobago, and doctoral research completed in 2025. The central question motivating this body of work is how a hydrocarbon-rich Small Island Developing State can transition to include renewables in a way that is technically feasible, economically sound, and

socially just. Addressing this question requires engagement with domains ranging from the physics of solar photovoltaic systems to the politics of the OWTU, and from energy system modeling to community consultations in Point Fortin and La Brea. The evidence synthesized in this review indicates that the technical challenges of renewable energy integration, while significant, are not the primary obstacle. The obstacle is political: a century of governing through resource rents has eroded the institutional capacity for democratic energy governance to such a degree that the transition risks reproducing the very injustices it is meant to resolve.

Trinidad and Tobago (T&T) occupies an unusual position in the global political economy of energy. As a Small Island Developing State [4] with substantial hydrocarbon endowments, it has experienced the structural contradictions of resource dependency in concentrated form. This places it within a growing body of scholarship on energy justice in small island contexts, including Ackah-Baidoo's [5] work on enclave petroleum in small states and Liu and colleagues' [6] study of stakeholder perceptions across thirty-four Caribbean small island jurisdictions, which shows how the inclusion and exclusion of energy-sector actors in policymaking shapes the perceived legitimacy of island energy governance. Boom-and-bust fiscal cycles, the centralization of governance alongside persistent accountability deficits, and the jarring coexistence of oil wealth with entrenched socio-economic inequality are structural features shared across this literature. Jobson [7] captures the T&T variant of this dynamic with the concept of the petro-state masquerade, i.e. the performance of institutional permanence and infinite resource abundance that state elites maintain even as production declines and reserves contract. This masquerade has been evident across recent decades, from the LNG boom of the 2000s, when gas reserves appeared inexhaustible, to the Petrotrin closure of 2018, when approximately 5,500 workers were dismissed with little warning [8], and to the current pursuit of cross-border gas from Venezuela [9, 10] even as the country makes carbon mitigation measures including renewable energy pledges to the Paris Agreement which have not been delivered in the timeline indicated.

However, energy justice offers an insightful perspective on the matter, yet it has not been applied to the long histories of petro-states in the Global South. To define energy justice, three interconnected principles are important: distributional justice, procedural justice, and recognition justice. Distributional justice means fair allocation of benefits and burdens. Procedural justice concerns the openness and accountability of the decision-making process, while recognition justice concerns recognizing the identity, knowledge, and interests of all involved parties [11]. These ideas are explored further by Heffron and McCauley from the perspectives of law, economics, philosophy, and politics [12]. This review builds on that interdisciplinary synthesis by applying the tripartite framework to T&T's 169-year hydrocarbon history, with an explicit orientation toward future energy systems and decarbonization policy. The urgency of this analysis is sharpened by present circumstances that distinguish this moment from previous boom-and-bust cycles. With domestic reserves in decline, ongoing negotiations over Venezuelan cross-border gas fields, and mounting international pressure to decarbonize,

the terms of any new social contract are actively being contested. T&T's Second Nationally Determined Contribution (NDC) [13] under the Paris Agreement commits to a 15 percent reduction in greenhouse gas emissions below 2013 levels by 2035, with an interim target of 30 percent renewable electricity by 2030. Yet as of 2025, the country has minimal utility-scale renewable energy capacity operational beyond the recently commissioned Brechin Castle solar facility [14], and the legislative framework for distributed generation through feed-in tariffs and net metering remains incomplete [15]. Modeling studies for the inclusion of utility-scale projects for the country, beyond which critical excess electricity production would create grid management challenges [16,17]. The gap between these technical findings and the institutional capacity to implement them is itself an energy justice problem that, as Bouzarovski and Petrova [18] argue through their vulnerability framing of domestic energy deprivation, cannot be addressed through technical solutions alone. In this review, the following issues will be addressed:

- The stages in the development of hydrocarbons in T&T from 1857 to 2026, and what caused the shifts between these stages?
- Energy injustice in major controversies and shifts when viewed through distributional, procedural, and recognition perspectives?
- How has the implicit social contract between the state, energy workers, and citizens changed during resource boom, structural adjustment, and institutional changes?
- What institutional arrangements should exist for creating a social contract in favor of energy democracy and justice under decarbonization?

The review proceeds as follows: Section 2 describes the methodology, including the PRISMA 2020 protocol, search strategy, inclusion and exclusion criteria, and the reflexive positionality statement that contextualizes the author's dual role as a policy advisor and academic reviewer. Section 3 develops the theoretical framework. Section 4 maps the energy sector chronologically across seven phases. Sections 5 and 6 present findings and discussion. Section 7 offers comparative analysis. Section 8 develops policy implications, including a proposed decarbonization pathway through 2065. Section 9 addresses limitations and future research directions. Section 10 concludes.

2. Methodology

This structured literature review follows the PRISMA 2020 guidelines [19] for transparent reporting of source selection, while acknowledging that the synthesis is qualitative rather than quantitative. The review is more accurately described as a systematic literature review that employs PRISMA-standard documentation of the search and screening process without the quantitative meta-analysis for which the PRISMA protocol was originally designed.

2.1 Literature search strategy

A systematic search strategy was employed in the five databases Scopus, Web of Science, JSTOR, Google Scholar, and the UWI Repository. The search strategy used Boolean keyword groups across the following four areas: energy justice principles; Caribbean context (T&T and the region); energy industry terminology (hydrocarbons and renewables); and social/governance aspects (social contract,

labor, and just transition). Targeted searches examined the 1937 riots, the closing down of Petrotrin, the Alutrint smelter, and the OWTU's history. The time period is from January 2024 to March 2026. This included publications from the Ministry of Energy and Energy Industries, the Central Bank of T&T's annual reports, the International Monetary Fund (IMF) Article IV consultations [20], the International Energy Agency's policy reviews, and OWTU archival records [21]. Grey literature sources were evaluated against three quality criteria: the institutional authority of the producing organization; the methodological transparency of any data presented; and the corroboration of key factual claims through independent peer-reviewed sources. The Climate Strategies policy briefing co-authored by the author to inform a draft national Just Energy Transition Policy [22] is treated as primary research data, a product of the author's own stakeholder consultation process rather than as secondary literature. All related claims are cross-referenced against independent peer-reviewed sources where available.

The PRISMA 2020 flow diagram (Figure 1) documents the full selection process. The initial database search yielded 1,256 records. An additional 120 records were identified through grey literature searches and backward citation tracing. After duplicate removal, 1,089 records underwent title and abstract screening, of which 847 were excluded primarily for lacking relevance to T&T or the Caribbean. The remaining 242 records proceeded to full-text assessment, of which 181 were excluded for insufficient focus or methodological concerns. Sixty-one sources were ultimately included in the qualitative synthesis.

2.2 Inclusion and exclusion criteria

Inclusion criteria were applied in two phases. During the screening stage, documents were selected if they dealt with the energy sector in Trinidad & Tobago, the political economy of the Caribbean region, or comparisons of petro-state governance; theories such as energy justice, social contract theory, or just transition approaches; and future energy systems and decarbonization strategies for small islands. Inclusion criteria at the full-text stage included clear methodology, peer-reviewed journal articles or institutional reports, and relevance to at least one case study or the comparative approach. Exclusion criteria included unverified sources, biased communication, and newspaper articles.

2.3 Analytical framework and synthesis approach

The review integrates two theoretical streams. Energy justice theory provides the diagnostic framework through its three tenets: distributional justice, procedural justice, and recognition justice [11]. Social contract theory, particularly rentier state analysis [23] and Jobson's concept of the petro-state masquerade [7], provides the historical-political lens. The concept of extractive social contract erosion, introduced in Section 3.2, synthesizes these streams by identifying the structural mechanisms through which rentier governance progressively undermines accountability relationships. The synthesis approach is threefold: mapping the historical development across seven phases, applying the energy justice framework to four major episodes, and integrating comparative international evidence to identify policy mechanisms for managing the transition from hydrocarbon dependence to sustainable energy systems. Thematic coding

was applied to the included sources using an inductive-deductive approach: the three energy justice tenets provided deductive codes, while additional themes, including masquerade performance, epistemic violence, and institutional precondition, emerged inductively from the literature. Where sources presented conflicting accounts of key events, the account supported by the greater number of peer-reviewed sources was privileged, and the conflict was noted in the relevant section.

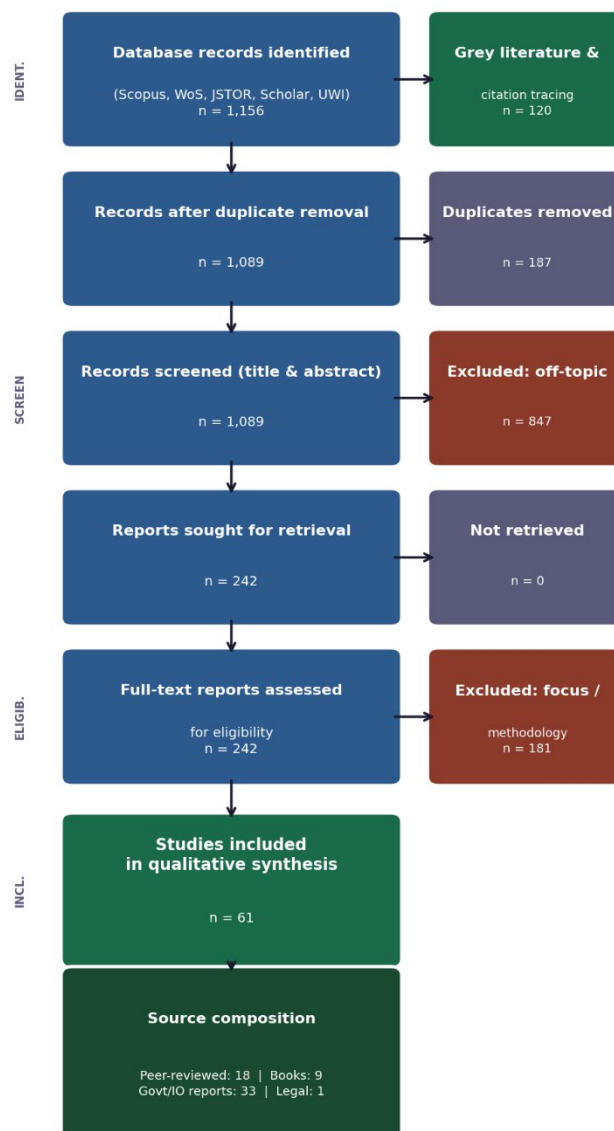


Figure 1. PRISMA 2020 Flow Diagram. This diagram documents the systematic identification, screening, and inclusion of sources: 1,256 initial records from databases and grey literature; 1,089 after duplicate removal; 242 proceeding to full-text assessment; 61 included in the final qualitative synthesis. The interdisciplinary nature of this review, which spans energy policy, political economy, labor history, and environmental justice literatures, required searches across databases with differing indexing conventions, as reflected in the title/abstract screening stage.

2.4 Positionality statement

The author's positionality requires explicit declaration. As a government renewable energy advisor and co-author of a policy briefing informing the national Just Energy Transition Policy [22], the author has prior institutional commitments that may shape the selection and interpretation of sources. The author's stakeholder consultations across T&T for the Just Transition Policy in 2023–2024 constitute primary data that inform several passages of this review, particularly in Sections 5 and 8. Passages drawing on this material are presented as findings of those consultations rather than as citations of secondary literature. The author's appointment as Lead Author for the Intergovernmental Panel on Climate Change (IPCC) Seventh Assessment Report (August 2025) in Working Group III-Energy Systems reflects an institutional orientation toward decarbonization that may influence emphasis in the policy sections. Readers should weigh these commitments in assessing the review's conclusions, and future independent replication of the comparative and thematic analyses is encouraged.

2.5 Scope and limitations

This review is delimited to T&T's hydrocarbon sector and its direct implications for future energy transition. The temporal scope extends from 1857 to 2026. Comparative analysis is necessarily selective. Every effort has been made to verify factual claims through multiple sources, though some colonial-era archival materials remain fragmentary [23,24] and certain government deliberations are not fully accessible.

3. Theoretical framework: energy justice and social contract

3.1 From abstract principles to petro-state diagnostics

The standard presentation of energy justice theory opens with textbook definitions: distributional justice concerns the allocation of benefits and burdens; procedural justice concerns the quality of decision-making; recognition justice concerns whose knowledge and identity count in energy governance. These definitions are correct, but sitting in a seminar room at UWI St. Augustine and reading them off a slide does not capture what distributional justice meant to a worker in the Fyzabad oilfields in 1937, facing wage cuts and hazardous conditions while British Petroleum exported profits [24]. What matters for T&T is not what distributional justice means in the abstract, but how it manifests when a colonial administration grants minimal royalties on oil extracted by foreign corporations. At the same time, local workers bear the environmental and physiological costs [25].

The tripartite framework emerged from environmental justice scholarship in the early 2010s, with McCauley et al. [26] identifying distribution, procedure, and recognition as the three central tenets, and Jenkins et al. [11] consolidating these into a conceptual review that has since become the field's primary organizing structure. In extending the framework across legal, economic, philosophical, and political science disciplines, Heffron and McCauley [12] established energy justice as both a normative commitment and an analytical tool applicable across governance scales. Their interdisciplinary synthesis is particularly relevant to this review's combination of historical political economy analysis with forward-looking transition policy. Sovacool and

Dworkin [27] advanced a complementary approach through eight core principles that provide actionable criteria for policy evaluation, later consolidated by Sovacool et al. [28]. For this review, the three-tenet framework is primary because its parsimony allows clearer historical application across episodes spanning nearly a century. At the same time, the eight principles inform the policy recommendations in Section 8.

The theoretical contribution of this review lies not in modifying the energy justice framework itself but in connecting it to the dynamics of social contract erosion in rentier states. When applied to T&T's history, the three tenets reveal a pattern that recurs with variations across all four episodes examined: distributional failures expose the limits of rent-based redistribution; procedural deficits expose the democratic vacuum within state planning; recognition gaps illuminate the marginalization of subaltern populations under resource capitalism. The concept of extractive social contract erosion, introduced in Section 3.2, specifies the structural mechanism that connects these three dimensions: it identifies the underlying condition of which the three tenets are symptoms. This insight emerged from juxtaposing energy system modeling work, which demonstrated the technical feasibility of renewable integration, with policy consultation work, which revealed institutional barriers to implementing even technically straightforward reforms.

3.2 The social contract in petro-states

In hydrocarbon-dominated formations, the implicit agreement between citizens and state [29] is distorted by rentierism. When states finance themselves through external resource rents rather than domestic taxation, the accountability relationship between rulers and ruled is structurally weakened [23]. The petro-state does not need to make concessions to a taxing public; instead, it tends toward distributive co-optation, using rents to subsidize consumption, expand public employment, and dampen political opposition. Jobson's concept of the petro-state masquerade identifies the ideological dimension of this arrangement [7]. State managers project a performance of fiscal permanence and developmental progress that masks declining production, reserve depletion, and structural vulnerability. This masquerade is directly observable in T&T's political discourse. Policymakers routinely invoke the country's status as an energy power even as domestic gas production has fallen by more than a third from its 2010 peak [30] and the Petrotrin refinery, once a symbol of industrial sovereignty, stands permanently closed. When the material capacity to sustain this performance collapses, what follows is what is termed here extractive social contract erosion: a breakdown of state-citizen reciprocity that exposes the absence of democratic foundations beneath the surface of rentiers.

This concept differs from standard resource curse analyses [31,32], which focus on economic outcomes such as Dutch disease and price volatility. Extractive social contract erosion focuses on the political mechanisms through which rentier governance hollows out accountability relationships that would otherwise enable just transition planning. Where the resource curse thesis asks why petro-states fail to convert resource wealth into development, extractive social contract

erosion asks why they fail to govern justly and ultimately why the institutional capacity for democratic energy governance erodes even when rents remain. This distinction is consequential for policy: the resource curse suggests that better macroeconomic management is sufficient, whereas erosion of the extractive social contract suggests that institutional democratization is the prior requirement. In the Just Transition Policy consultations, this incompatibility recurred: community representatives with knowledge relevant to energy project sitting were treated as obstacles rather than resources, and workers with decades of sector experience were excluded from discussions about what should replace the project [22].

3.3 Integrating theory for transition policy

Energy justice theory and social contract theory address different aspects of the same problem. The three justice tenets identify where the petro-state is failing; the social contract framework explains why it fails consistently, across different ownership structures and different commodity cycles. An energy-just social contract would correct each failure: distributing benefits and risks equitably, guaranteeing meaningful participation for all civic actors, and treating the knowledge of workers and communities as authoritative rather than advisory [33]. This integrated framework has direct implications for T&T's current policy challenge. The country's Second NDC commits to 30 percent renewable electricity by 2030, and a 15 percent emissions reduction by 2035 [13], yet the institutional architecture to achieve these targets remains underdeveloped.

Without addressing the procedural and recognition deficits that have characterized hydrocarbon governance, any transition to renewable energy risks reproducing the same patterns of top-down decision-making, community exclusion, and worker marginalization. The technical pathways to decarbonization are well understood within the international assessment literature; the outstanding problem is one of governance: ensuring that those pathways are traversed justly.

4. A chronological mapping of T&T's energy sector (1857–2026)

The evolution of the hydrocarbon industry in T&T goes through seven stages, each stage characterized by its own dynamics of property rights, labor, and government-citizen relations (Figure 2). The key point is that phase changes were rarely smooth or planned; they resulted from external events such as price drops, wars, or political changes in the international environment. This reactive governance model creates certain challenges for the decarbonization strategy that requires forward-looking planning.

4.1 Early exploration and colonial development (1857–1928)

British colonial interest in Trinidad's hydrocarbon potential intensified following geological surveys in 1855 [1], which highlighted the industrial utility of the La Brea Pitch Lake. Two years later, the Merrimac Oil Company completed what would become one of the world's earliest commercial oil wells, though mechanical limitations led to its abandonment by 1859. Sustained commercial development came later.

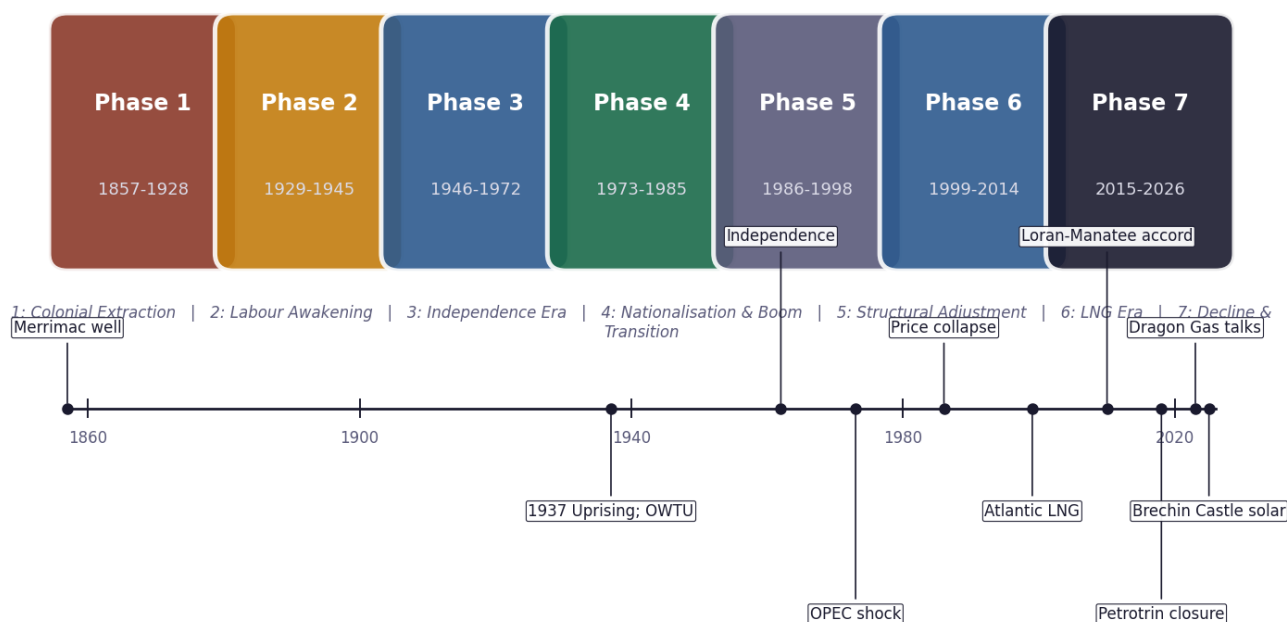


Figure 2. Historical Development Timeline (1857–2026) — A chronological timeline illustrating seven distinct phases of hydrocarbon governance in T&T, from colonial extraction through the contemporary transition period. Major policy and industrial milestones are annotated for each phase: the Merrimac well (1857); the 1937 uprising and OWTU registration; independence (1962); the OPEC shock and nationalizations of the 1970s; Atlantic LNG commissioning (1999); the Petrotrin refinery closure (2018); and current Dragon Gas negotiations alongside the 30 percent renewable electricity target for 2030. The pattern that emerges is one of externally driven transitions rather than deliberate strategic planning.

In 1866, Walter Darwent's Paria Petroleum Company achieved the island's first commercially viable discovery at Aripiero, exporting roughly sixty gallons per week. After Darwent died in 1868, exploration stagnated until the rise of the internal combustion engine created new demand in the early twentieth century. In 1907, however, capital-backed companies returned. United British Oilfields of Trinidad established the first refinery on the island at Point Fortin in 1912, and Trinidad Leaseholds Limited constructed another at Pointe-a-Pierre between 1916 and 1917. Production increased from 47,000 barrels in 1910 to over one million barrels per year in 1914. This created a distinctly colonial extractive structure that set the template for decades of distributional injustice. Foreign corporations monopolized strategic decision-making, royalties to the colonial administration were minimal, and the local population was confined to hazardous, low-wage manual work. The wealth generated passed through the island rather than staying within it. The annual reports of Trinidad Leaseholds, preserved in the UWI archives, starkly document this asymmetry: millions of barrels were exported, with only a nominal fraction of the per-barrel value retained locally. That pattern of extraction without redistribution would recur in modified form throughout the nationalization era and beyond.

4.2 Labor Awakening and the World War II Era (1929–1945)

The Great Depression sharpened grievances built up since the 1920s, with the collapse of the sugarcane and cocoa industries [25,34]. Workers faced systematic wage cuts, underemployment, substandard company housing, inadequate medical provision, and explicit racial stratification in corporate hierarchies. On 19 June 1937, these tensions broke into open revolt [34]. Beginning at the Apex Oilfields in Fyzabad under Tubal Uriah 'Buzz' Butler [25], a Grenadian migrant and veteran of the British West India Regiment, the action broadened into a general strike that drew in dockworkers, agricultural laborers, railway operators, and commercial employees across the island. The colonial state responded with military force, deploying HMS Exeter and Ajax. Before the strike concluded on 2 July, fourteen people had been killed, hundreds injured, and many more imprisoned [34]. Out of this rupture came the formal institutionalization of the domestic labor movement: the OWTU was registered on 15 September 1937 and became the primary vehicle through which workers would demand recognition, procedural access, and a fairer share of energy revenues [21]. OWTU's formation asserted recognition justice: a demand that workers be treated as legitimate actors rather than expendable inputs. The union's survival through the wartime years, when colonial authorities repeatedly threatened dissolution, indicates the depth of the grievances it channeled.

4.3 Post-war expansion and the independence era (1946–1972)

The post-war years brought steady OWTU growth and the gradual formalization of collective bargaining [21]. The union secured its first comprehensive industrial agreement in 1945. The 1960 Texaco strike won a 44-hour working week; a 1963 action against British Petroleum secured wage

increases; and a 1964 dispute with Texaco produced the sector's first pension plan. Political independence in 1962 transformed the terrain of energy governance. Under Prime Minister Eric Williams and the People's National Movement (PNM), the post-colonial state articulated a doctrine of resource nationalism that treated public participation in the hydrocarbon sector as inseparable from genuine sovereignty [35,36]. By 1967, the OWTU recognized that collective bargaining alone could not address the structural dependencies of a foreign-dominated enclave economy, culminating in a 1969 joint-venture arrangement that created Trinidad-Tesoro and established the state's first direct equity stake in upstream production [1].

4.4 Nationalization and the first oil boom (1973–1985)

The 1973 OPEC price shock transformed T&T's fiscal position virtually overnight [37]. As crude prices quadrupled, state revenues expanded to fund infrastructure, universal secondary education, healthcare, and social safety nets. The ideological basis had been established in the PNM's 1970 Chaguaramas Declaration, which rejected both laissez-faire capitalism and command socialism in favor of state-directed resource nationalism [35]. A sequence of nationalizations followed: the National Petroleum Marketing Company in 1972, Shell Trinidad's assets acquired to form TRINTOC in 1974, the National Gas Company chartered in 1975, and Texaco's local operations purchased in 1985 [1]. This was not the case, however, as evidenced by the Black Power Revolution of 1970, which highlighted gaps in socio-economic equity that oil income had not solved, and the strike at Pointe-a-Pierre of 1975, where the control of oil and sugar by the state had failed to foster democratic workplace interactions. Nationalization changed ownership of the resource, not its governance. The social gains of the boom years proved fragile: households that obtained employment and education during the 1970s bore the brunt of the 1980s adjustment through retrenchment, wage cuts, and reduced public services [37].

4.5 Structural adjustment and neoliberal reform (1986–1998)

The collapse of international crude prices in the mid-1980s, from over \$30 per barrel in 1985 to below \$15 in 1986 [38], abruptly ended the oil boom. The National Alliance for Reconstruction government entered structural adjustment programs [39] with the IMF and the World Bank, implementing currency devaluations, public-sector wage cuts, civil service retrenchments, and subsidy rollbacks. Social destabilization followed: the 1990 Jamaat al Muslemeen attempted coup reflected widespread public anger at the costs of adjustment. In 1993, the state merged TRINTOC and TRINTOPEC to form Petrotrin [1]. The structural costs fell disproportionately on working-class households, while multinational energy corporations secured highly favorable fiscal terms. The net effect was a fragmented social contract: the developmental state's promises were withdrawn without any democratically legitimate alternative.

4.6 The LNG era and the second boom (1999–2014)

The 1999 LNG export commercialization brought the country into the international natural gas arena, making it the largest LNG exporter in the Western Hemisphere. The Heritage and Stabilization Fund (HSF) Act of 2007 established

a sovereign wealth fund to stabilize prices. But the bonanza highlighted, rather than hid, the structural weakness: hydrocarbons contributing almost 40 percent to GDP and more than 80 percent of the country's export revenues. Despite being aware that natural gas deposits were finite.

4.7 Decline, crisis, and the Petrotrin closure (2015–2018)

The 2014 oil price crash severely affected Petrotrin. By 2018, the company owed more than TT\$13 billion [40], was producing less than 40,000 bpd against a refinery capacity of 140,000 bpd, and had incurred more than TT\$8 billion in losses over five years. The closure was announced on 28 August 2018; refining ceased at the end of October 2018, and Petrotrin ceased operations on 30 November 2018 [8]. More than 5,500 employees lost their jobs, adversely affecting southern Trinidad. The union referred to liquidation as an act of war against organized labor. Table 1 summarizes the pre- and post-closure metrics.

Table 1. Petrotrin Restructuring: Pre- and Post-Closure Indicators. The most dramatic outcome was the irreparable destruction of domestic refining capacity, leaving Trinidad & Tobago unable to meet its domestic refined-product needs and entirely reliant on imports.

Metric	Petrotrin (2018)	Heritage Petroleum (Post-Restructuring)
Refinery Operations	Active (140,000 bpd capacity)	Permanently Closed [8]
Financial Position	TT\$13bn+ debt (2016); TT\$8bn cumulative losses [8,40]	Restructured for E&P focus
Direct Workforce	5,500+ permanent and temporary jobs lost	Core E&P workforce retained under Heritage [8]
Fuel Strategy	Self-sufficient via domestic refining	Total dependence on imports via Paria Fuel Trading [8]

All three dimensions of justice were violated through the process. Distributionally, the shock was absorbed by only those workers and families directly affected. Procedurally, the decision was unilaterally implemented, not negotiated: the affected workers, trade unions, and local municipalities had no say in the matter. About recognition, the state viewed the Petrotrin workforce as a burden, ignoring years of experience and union proposals for alternative restructuring. The consequences remain visible: elevated regional unemployment, collapsed local businesses, and an annual commemorative march marking the closure's anniversary as an ongoing demand for recognition.

4.8 Contemporary challenges and future prospects (2019–2026)

Three interlocking pressures define T&T's current energy situation. Mature field production declines have reduced natural gas output from a peak of roughly 4 billion cubic feet per day in 2010 to approximately 2.6 billion in 2024 [30], a decline of more than one-third. The country's Paris Agreement commitments require a fundamental restructuring of domestic energy production [13].

Geopolitical dependencies have intensified, with the government's strategy increasingly tied to cross-border negotiations over gas fields shared with Venezuela. Dragon field, located in Venezuelan waters with 4.2 tcf of gas, is one of the projects [9]. Licenses for the project were issued in January 2023, but then work ceased due to US sanctions imposed against Venezuela that were renewed in April 2025. Regulatory approval in October 2025 has enabled Shell and the NGC to proceed with production, with first gas expected by the end of 2027 [10]. The risks involved with the geopolitical factor are quite obvious – the viability of the project depends on the sanctions policy of the US and the political situation in Venezuela, both being beyond domestic control. The connection will be analyzed further in section 7.

The Brechin Castle solar project [14], an approximately 92-megawatt (ac) facility developed by Brechin Castle Solar Limited, a joint venture of bp, Shell and the National Gas Company, became the country's first grid-scale renewable energy project when it transmitted its first power to the national grid in July 2025. A national Wind Resource Assessment Programme is underway, with Light Detection and Ranging (LiDAR) devices deployed at high-potential onshore and offshore locations [41]. Beyond the immediate technical parameters, the pathway to 30 percent renewable electricity by 2030 requires sequenced infrastructure investment. Current planning has not yet specified this in detail. Grid modernization is the binding constraint. T&T's transmission and distribution network was designed around a small number of large, dispatchable gas-fired plants. Integrating distributed solar and wind at the scale envisaged will require automated demand response, expanded interconnection capacity between Trinidad and Tobago's separate grids, and battery storage sufficient to manage the intermittency that EnergyPLAN modelling identifies as the binding constraint beyond 400 megawatts of solar and 200 megawatts of wind [16]. The Ministry of Energy and Energy Industries' Wind Resource Assessment Programme, which includes LiDAR deployment at high-potential coastal and offshore sites, provides an evidentiary basis for site selection that did not exist a decade ago. But translating resource data into interconnection agreements, land-use approvals, and power purchase arrangements remains largely undone. Green hydrogen offers a second decarbonization pathway specific to T&T's industrial structure. Because the Point Lisas industrial estate already consumes natural gas as both fuel and petrochemical feedstock, the government's 2022 roadmap identifies green hydrogen production, using surplus renewable electricity to displace grey hydrogen in ammonia and methanol manufacture, as a mechanism for decarbonizing heavy industry without requiring the wholesale abandonment of the petrochemical sector [41].

This sector employs a significant share of the country's skilled industrial workforce. This sector-coupling strategy is more technically and politically feasible than a straightforward substitution of renewables for gas in electricity generation alone, because it preserves employment continuity in a sector whose workforce has already experienced one traumatic contraction. Realizing this potential, however, depends on exactly the institutional capacity this review identifies as historically weak: coordinated planning across the Ministry of Energy, the

National Gas Company, and private petrochemical operators, sustained over a fifteen-to-twenty-year horizon that outlasts any single political administration. The technical pathway to decarbonization is, in this sense, inseparable from the governance pathway. A review that stopped at documenting resource potential without confronting this institutional requirement would materially understate the scale of the challenge ahead. Figure 3 illustrates oil and natural gas production trends (1960–2025). A dual-axis time series showing crude oil production and natural gas production from 1960 to 2025, with key macroeconomic and policy events annotated. Oil production peaked in the late 1970s following the OPEC shock and has trended downward since. Natural gas production rose steadily through the 1990s and 2000s before plateauing around 2010 and entering a gradual decline. The shaded region marking the structural adjustment period of 1986–1998 shows how both commodities were simultaneously depressed, creating the fiscal crisis that forced the neoliberal reforms of that era.

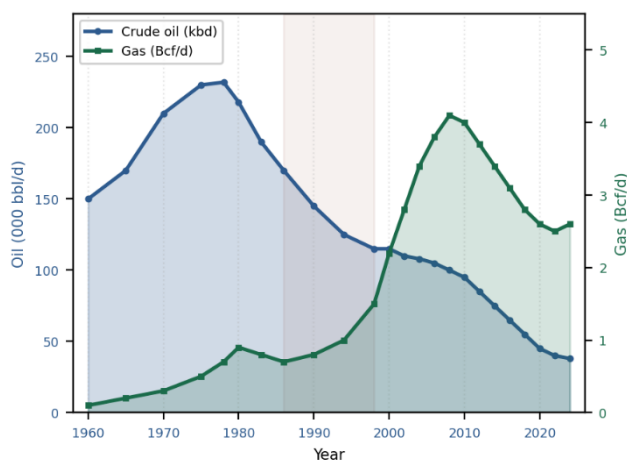


Figure 3. Oil and natural gas production trends (1960–2025)

5. Review findings: energy injustices across four episodes

The four episodes analyzed here represent the most consequential ruptures in the sector's development. When viewed through the three-tenet framework, they reveal patterns that recur across nearly a century. These patterns have direct implications for the current transition to renewable energy. Unless the underlying mechanisms of procedural exclusion and recognition denial are addressed, any new energy system will reproduce the same injustices in new forms.

5.1 The 1937 uprising: when distributional injustice became unbearable

At its root, the 1937 uprising was a crisis of distribution. Workers in the Fyzabad oilfields faced hazardous conditions without adequate safety protections or fair wages, while foreign corporations exported substantial profits [24]. The colonial wage structure was explicitly racialized: Indo-Trinbagonian and Afro-Trinbagonian workers received lower pay than European counterparts for equivalent work [24, 25], a practice that naturalized economic inequality through pseudoscientific hierarchies of racial capacity.

The procedural dimension was equally decisive. The colonial administration denied workers any institutional avenue for representation. Corporate managers refused to recognize worker delegates, the legal framework criminalized strike activity, and the state's resort to military suppression demonstrated its fundamental orientation toward protecting foreign capital rather than mediating industrial disputes [34]. The OWTU's formation asserted recognition justice: a demand that workers be treated as legitimate actors with knowledge worth hearing. Workers who understood the practical hazards of oilfield operations were treated as ignorant laborers whose observations carried no weight in safety planning. This assertion would recur throughout the union's subsequent history and remains relevant today, when state planners similarly dismiss community knowledge about the siting of renewable energy projects.

5.2 The OWTU's campaigns: nationalization without democratization

Under George Weekes's presidency from 1962 to 1987, the OWTU expanded its mandate [21] well beyond wage negotiations into the broader politics of resource sovereignty. Major industrial actions in 1960, 1963, 1975, and 1984 targeted distributional imbalances in wages and occupational safety. Still, they simultaneously engaged procedural and recognition deficits: the OWTU argued that political independence was hollow unless workers had genuine democratic input into the management of national energy assets. Nationalization produced mixed outcomes. The acquisition of multinational assets redirected resource rents into national development and created conditions for the indigenization of technical and managerial roles, representing a real distributional gain. But state ownership did not automatically produce internal democratic accountability. The deployment of security forces to suppress the 1975 Pointe-a-Pierre strike showed that public ownership could reproduce the exclusionary practices of private capital. Nationalization changed who owned the oil; it did not change who governed it. This distinction matters for contemporary transition policy. Simply transferring ownership of renewable energy infrastructure from foreign to domestic hands will not achieve energy justice without accompanying democratic governance reforms. The Brechin Castle solar project, while a welcome development, was negotiated between the government and international energy companies with limited community input.

5.3 The Alutrinc controversy: procedural shortcuts and community resistance

The proposed Alutrinc aluminum smelter at La Brea, a US\$465 million contract for a 125,000-tonne-per-year facility, illustrates what happens when procedural safeguards are treated as bureaucratic obstacles. The project generated intense grassroots opposition focused on hazardous spent pot lining, sulfur dioxide emissions, and cumulative environmental impacts. In June 2009, the High Court quashed the Certificate of Environmental Clearance because the Environmental Management Authority did not account for cumulative effects or conduct sufficient consultations [42]. The residents of La Brea knew more about health risks associated with industrial pollution than distant policymakers because they had lived through it firsthand.

State planners dismissed local environmental concerns as anti-development sentiment rather than treating them as legitimate knowledge contributions, a characteristic failure of recognition. The lessons of Alutrin are directly applicable to current renewable energy planning: rigorous cumulative impact assessment, continuous public consultation, and respect for community knowledge are not procedural luxuries but institutional necessities. Stakeholder consultations conducted during the development of the Just Energy Transition Policy found that communities were not opposed to renewable energy development in principle but were deeply skeptical of state-led projects that replicated the top-down decision-making patterns of the hydrocarbon era.

5.4 The Petrotrin closure: the masquerade collapses

The 2018 refinery closure represents the most significant recent test of energy justice in T&T, and the state failed it on all three dimensions. A geographically concentrated working-class population absorbed economic shock, with few alternative employment options. The decision was made through an opaque executive process that excluded the union, the workforce, and regional municipal authorities [8]. OWTU's alternative restructuring proposals were dismissed without serious engagement. Former Petrotrin workers interviewed during the draft Just Transition Policy consultations described the closure as a betrayal of both their employment contracts and the implicit promise that the state-owned refinery would remain in operation [22]. The recognition failure was perhaps the most insidious aspect. The state deployed a media narrative that framed the Petrotrin workforce as overcompensated and inefficient, systematically eroding the public standing of workers who had spent careers building technical expertise. The injury was epistemic as well as economic: the campaign denied the validity of localized knowledge and positioned workers as obstacles to modernization. The annual commemorative march that marks the closure's anniversary is a continuing demand for recognition: a refusal to let the workforce's experience be erased from the national narrative. The persistence of this commemorative practice indicates that the grievance remains unresolved. Any just transition framework that does not explicitly address this legacy of erasure will fail before it begins.

6. Discussion: the eroding social contract

6.1 From colonial extraction to petro-state fragility

Under colonial administration, the social contract operated on a straightforward extractive logic: foreign corporations monopolized resources, the imperial administration collected minimal royalties, and the domestic population provided cheap labor while absorbing environmental costs [24]. Organized labor resistance, culminating in 1937, forced incremental concessions but left the extractive foundations intact. Constitutional independence in 1962 provided the formal framework for renegotiation, but the institutional habits of colonial extraction proved remarkably durable. Post-independence governments articulated a new contract grounded in state-led industrialization and resource nationalism. The 1970 Chaguaramas Declaration proposed state ownership of the commanding heights of the economy as the path to genuine sovereignty [35]. The first oil boom provided fiscal resources

to attempt this model. Yet near-total dependence on hydrocarbon rents left non-energy sectors atrophied, and resource-rent distribution became intertwined with political patronage networks. The mid-1980s price collapse dissolved these material foundations [38]. Through structural adjustment, the state had to dismantle the redistributive system established during the boom. The working classes actually experienced reduced wages and poorer public services. The legacy was a loss of faith in state institutions, an erosion of workers' bargaining power, and a tendency toward top-down decision-making that would resurface thirty years later with Petrotrin.

6.2 The petro-state masquerade and contemporary erosion

The LNG expansion of the 2000s temporarily stabilized the fiscal position [43], but it did not address underlying vulnerabilities. Hydrocarbon dependence actually intensified [44], and the diversification that state managers periodically promised was never seriously pursued. The 2018 Petrotrin closure was the moment when the masquerade became unsustainable [8]: the state could no longer insulate the labor force from market pressures, and the gap between developmental promise and distributional reality became impossible to deny. T&T is now in an advanced stage of erosion of the extractive social contract. The current transition to renewable energy could, in principle, provide the foundation for a renewed social contract. But every previous transition from colonial extraction to nationalism, from nationalism to neoliberalism, from oil to gas has been managed as a top-down executive decision rather than a participatory democratic process. Without explicit institutional safeguards, the transition to renewables risks becoming another imposed restructuring, with the same communities and workers bearing costs while elite actors capture benefits. Figure 2 presents seven external transition stages that have not been planned and lack involvement from impacted communities or workers. However, decarbonization demands a carefully planned transition that involves those most affected by the process rather than excluding them.

7. Comparative analysis: international perspectives

This section compares T&T with five hydrocarbon-producing jurisdictions selected to represent a spectrum from successful transition management to state collapse: Norway, Nigeria, Venezuela, Alaska, and Scotland. These cases offer theoretical contrast across distinct configurations of the three justice dimensions. Table 2 summarizes the comparative assessment. The Norway comparison challenges the assumption that small population size and high resource dependence inevitably lead to governance failure. The Government Pension Fund Global (GPF) converts hydrocarbon revenues into financial assets under transparent fiscal rules [45]. Ryggvik's historical analysis demonstrates that this success emerged from decades of public debate and incremental policy learning, not automatic institutional virtue [55]. However, Norway's model is not directly transferable: its population is socially homogeneous compared to T&T's complex ethnic demographics; its democratic institutions were well-established before oil discovery; and its labor movement has been integrated into

policy-making rather than excluded. These preconditions are absent in T&T, which means institutional reform must create them rather than assume them. Venezuela represents the most extreme case of the erosion of the extractive social contract and is particularly instructive given T&T's current dependence on Dragon gas. Oil production fell from 3.4 million barrels per day in 1998 to roughly 700,000 barrels per day by 2023 [48], and a prolonged economic collapse, including hyperinflation, rendered the currency virtually worthless [51]. PDVSA's collapse into a vehicle for political patronage illustrates the terminal stage of rentier governance [51,56]. For T&T, the Venezuelan case carries direct material consequences: the Dragon field arrangements make T&T's energy security directly contingent on the stability of a state experiencing precisely the trajectory that extractive social contract erosion predicts. Any just transition framework must account for this geopolitical exposure.

Nigeria's Niger Delta exemplifies the violent consequences of recognition failure: decades of oil spills and gas flaring have produced a humanitarian crisis [49]. The United Nations Environment Programme's 2011 assessment documented severe ecological damage that would require decades of remediation [50]. Scotland's Just Transition Commission and Alaska's Permanent Fund Dividend (PFD) offer more applicable models, combining direct citizen benefit-sharing with institutionalized participatory structures [52,54]. North Sea research similarly indicates that carbon capture and storage, if governed inclusively, can provide a bridging role in just transitions for oil-dependent regions [57]. Three conclusions emerge from this comparison: resource dependence alone does not determine governance quality; the absence of procedural justice reliably predicts transition failure; and recognition justice remains the least developed dimension across all cases.

8. Policy implications: toward an energy-just social contract

The policy framework developed in this section grows directly out of the historical analysis and comparative evidence reviewed above. It is an integrated argument about the institutional change required to prevent the renewable energy transition from reproducing the injustices of the hydrocarbon era. Each proposal addresses a specific gap identified in the historical analysis and faces specific political economy obstacles that explain why similar proposals have failed to advance in the past.

8.1 The governance gap and how to close it

The most fundamental problem identified in this review is the absence of institutional mechanisms through which communities and workers can exercise genuine decision-making authority over energy policy. What is required is a statutory National Energy Council with a legislative mandate to review and approve long-term energy policy, major industrial developments, and resource-rent allocation frameworks. The Council should comprise state representatives, industry executives, OWTU delegates, civil society organizations, environmental scientists, and independent economists, and function as a decision-making rather than advisory body. The political economy obstacle is substantial: the PNM's historical dominance has created a political culture in which executive decision-making is treated as a prerogative of electoral mandate, and the energy sector's technical complexity has been used to justify insulating decisions from public scrutiny. Overcoming these obstacles requires legislation that future governments cannot easily dismantle. The policy briefing [22] includes specific legislative drafting recommendations for such a Council.

Table 2. Comparative assessment of energy justice dimensions across six hydrocarbon-producing jurisdictions. T&T scores weakly on procedural and recognition justice, aligning it more closely with Nigeria and Venezuela than with Norway and Scotland, despite its higher per-capita income

Jurisdiction	Resource Dependence	Distributional Justice	Procedural Justice	Recognition Justice	Transition Readiness	Key Policy Lesson
Trinidad and Tobago	High (>40% GDP) [44]	Weak (uneven rents)	Weak (top-down) [8]	Weak (workers dismissed) [8]	Low (no plan) [15]	Participatory restructuring essential
Norway	High (~20% GDP) [45]	Strong (GPFG, welfare) [45]	Strong (tripartite) [46]	Moderate (Sami rights) [47]	High (electrification) [46]	Sovereign wealth + inclusive institutions
Nigeria	Very High (>90% exports) [48]	Very Weak (corruption) [49]	Weak (military eras) [49]	Weak (Delta neglect) [50]	Low (flaring persists) [50]	Resource democracy + environmental repair
Venezuela	Extreme (>95% exports) [48]	Collapsed (hyperinflation) [51]	Collapsed (authoritarian) [51]	Collapsed (civil society) [51]	Very Low (sanctions) [10]	Avoid rentier authoritarianism
Alaska (USA)	High (>80% revenue) [52]	Moderate (PFD exists) [52]	Moderate (public input) [53]	Weak (Indigenous rights) [53]	Moderate (renewables) [52]	Direct dividends + community funds
Scotland (UK)	Moderate (North Sea) [54]	Moderate (debate ongoing) [54]	Moderate (Just Transition CT) [54]	Moderate (community energy) [54]	High (net-zero 2045) [54]	Just Transition Commission model

For all large-scale energy developments, the regulatory framework should legally require early and continuous public consultation, free, prior, and informed consent from host communities, full public disclosure of environmental impact assessments and contracts, independent grievance mechanisms, and third-party auditing of socio-ecological externalities. The procedural failures surrounding the Petrotrin closure and the Alutrint controversy demonstrate what is at stake when these safeguards are absent [8,42]. Worker co-determination within state-owned energy enterprises, drawing on Nordic and German frameworks, in which elected worker representatives hold board voting rights, could reduce the informational asymmetries that enabled the 2018 closure.

8.2 Benefit-sharing: decoupling resource wealth from patronage

Dismantling historical distributional inequalities requires fiscal mechanisms that reduce public welfare's dependence on political discretion. HSF's legislative framework should be reformed to guarantee full operational transparency and independent civic oversight [58]. Drawing on the Alaska PFD model, a defined proportion of annual yields should be distributed directly to citizens as a resource dividend, making redistribution automatic rather than dependent on political discretion. Binding Community Benefit Agreements [59] should be required for all areas hosting extraction, downstream infrastructure, or renewable energy installations, specifying employment quotas for residents, direct reinvestment of corporate revenues into municipal infrastructure, and community-managed ecological remediation funds. A progressive windfall tax on energy rents during high-price periods should capitalize social infrastructure [23,31], particularly education and health, rather than cycling into recurrent expenditure.

8.3 Just transition: planning before the next crisis

With domestic reserves in decline [30] and decarbonization pressure intensifying, a just transition framework is an immediate policy requirement, not a future aspiration. Drawing on published research [16] and the Just Energy Transition Policy consultations [22], such a framework should include a sector-wide labor-market assessment identifying vulnerable worker groups and transferable skills; fully subsidized technical retraining in renewable energy systems, energy efficiency, and ecological restoration; transitional income guarantees for workers undergoing retraining; voluntary early retirement with full pension preservation; and direct job placement mechanisms linked to green infrastructure projects [60]. Spain's coal region transitions and Germany's coal phase-out protocols demonstrate that well-funded, community-centered transition frameworks are essential to maintaining stability during industrial shifts [61]. For T&T specifically, the just transition must address both the shift from fossil fuels to renewables and the potential decline of the entire gas-based industrial complex at Point Lisas as domestic reserves deplete [30]. This requires industrial policy as much as energy policy, identifying new export-oriented manufacturing sectors that can absorb the technical workforce currently employed in petrochemicals. EnergyPLAN modeling suggests that diverting gas from electricity generation to petrochemical

production could extend the downstream sector's economic viability while renewables meet growing power demand [16].

8.4 Recognition and energy democracy

Recognition justice requires moving beyond consultation rhetoric toward genuine energy democracy: democratizing energy governance through decentralized ownership, public accountability over utility infrastructure, and the formal elevation of localized and worker knowledge [33]. In concrete terms, this translates into establishing community-owned solar cooperatives for locally generated energy and income within municipal neighborhoods; participatory budgeting for energy infrastructure; and worker management in public utilities. These proposals are grounded in two T&T-specific realities: first, the existence of community-level organizations including cooperative credit unions and neighborhood associations that could serve as governance vehicles for decentralized renewable projects; and second, the legislative precedent of the Cooperative Societies Act, which already provides a framework for community-owned enterprises that could be adapted to energy cooperatives without requiring new primary legislation. The rejection of the alternative plan presented by OWTU regarding the restructuring of Petrotrin demonstrates a failure to recognize the importance of the knowledge refinery workers have accumulated over time.

8.5 A justice-informed decarbonization pathway

Figure 4 presents the decarbonization strategy for Trinidad and Tobago up to 2065, based on both EnergyPLAN outputs and recommendations from the Just Energy Transition Policy consultations on governance issues. The strategy is normative rather than predictive; it represents what a just transition might be like if the suggested changes are implemented. Procedural reforms must come first: without genuine decision-making authority, communities and workers cannot shape the distribution and recognition arrangements that follow. Distributional instruments become critical as renewable deployment scales up in the 2030s. Recognition measures are most urgent during the period of rapid structural change, when the risk of repeating the Petrotrin pattern, i.e. top-down restructuring with excluded communities, is highest. The Brechin Castle solar project, already operational, demonstrates that utility-scale renewables are viable in T&T's context. What is missing, and what this pathway seeks to provide, is the institutional architecture for participatory governance that would enable the deployment of these technical and financial resources in a manner consistent with energy justice principles.

The pathway's four governance phases correspond to concrete near-term milestones, not an abstract sequence. Between 2025 and 2030, the priority is to establish the National Energy Council and the community consent mechanisms described in Section 8.1, and to complete the wind resource programme's transition from assessment to procurement. Without this procedural foundation in place before renewable capacity scales up substantially, the distributional and recognition instruments proposed for the 2030s risk being retrofitted onto decisions already made without them. That would repeat the pattern documented throughout the hydrocarbon era in this review. The 2030s phase, when solar and wind deployment is projected to expand most rapidly, is when Community Benefit Agreements

and Heritage and Stabilization Fund reform [58] must be operational. This is precisely the period when new infrastructure siting decisions, and the distributional questions they raise, will be most frequent. By the 2040s, as the modeling shows gas generation falling below half of total supply, the workforce implications become acute. The retraining and income-guarantee mechanisms drawn from Spain and Germany's coal transition experience [60, 61] need to be already functioning by this point, rather than being initiated in response to closures, given that the Petrotrin case demonstrates how quickly an unplanned contraction can outpace any subsequently assembled just transition response.

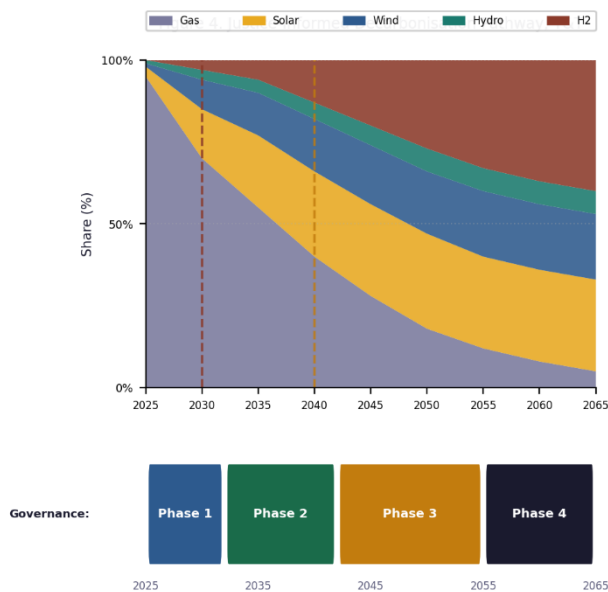


Figure 4. Just energy transition decarbonization pathway (2025–2065): A stacked area chart showing electricity generation by source from 2025 to 2065. Natural gas declines from near-total dominance to roughly 10 percent of generation by 2065, while solar PV, wind, and green hydrogen [41] expand to fill the gap. The bottom panel maps energy justice tenets to phases of technical transition: procedural reforms (National Energy Council, community consent mechanisms) must precede distributional instruments (Community Benefit Agreements, HSF reform) in the 2030s, which in turn enable recognition measures (worker co-determination, community solar cooperatives) during the period of most rapid structural change [16].

The final phase, extending toward 2065, is where green hydrogen and full grid decarbonization converge with the energy democracy outcomes: decentralized ownership and participatory budgeting, which this review argues are the substantive measures of whether the transition has resolved the extractive social contract erosion documented in Sections 5 and 6 and/or merely reproduced it in renewable form. It is worth being explicit that this pathway is a normative proposal, not a forecast. EnergyPLAN modeling establishes what is technically achievable [16]. But whether T&T follows this trajectory, a different but comparably just one, or repeats the pattern of externally driven, reactive transition that has characterized every previous phase in this review's historical account, depends entirely on whether the institutional reforms proposed in Sections 8.1 through 8.4 are enacted

with the urgency the underlying physical transition already demands. Figure 5 illustrates a conceptual model for energy justice, degradation of the social contract, and just transition, a combined model that explains the tenets of energy justice and uses them as an analytical tool for identifying degradation of the social contract in petro states. It explains that the social contract degrades when state-citizen reciprocity erodes and governance shifts from democratic accountability to resource rents. Three transition paths include participatory governance, equitable benefit-sharing, and transition planning, and result in an energy democracy defined by decentralized ownership, community solar co-ops, participatory budgeting, and management and epistemic justice in policies.

9. Limitations and directions for future research

This review has several limitations that should inform how its conclusions are read. The reliance on publicly available sources means that some internal government deliberations, particularly around the Petrotrin closure and cross-border gas negotiations, are not fully accessible. The absence of Freedom of Information legislation in T&T means that ministerial correspondence and cabinet deliberations remain outside public scrutiny. The comparative analysis is necessarily schematic; each comparator possesses unique historical and institutional conditions that resist simple transplantation. The review's methodology, while following PRISMA 2020 guidelines [19] for source-selection transparency, is limited by the absence of formal inter-rater reliability testing and quantitative meta-analysis. The synthesis is qualitative and thematic, meaning claims about the prevalence of specific injustices should be treated as interpretive rather than definitive. The author's position as a government renewable energy advisor and co-author of the policy briefing informing the national draft Just Energy Transition Policy [22] introduces potential bias in source selection and interpretation, as declared in Section 2.4. The author's own research outputs, particularly [16,22], are treated as primary data in relevant sections, but this means the review's policy conclusions are partly grounded in prior work rather than solely in the synthesized secondary literature. Future independent replication of the comparative and thematic analyses would strengthen the evidence base for the policy recommendations advanced here. The review's focus on hydrocarbons means that renewable energy transitions are addressed prospectively rather than empirically. As T&T's renewable sector develops, research will be needed to assess whether the proposed framework captures the distributional and procedural dynamics of solar, wind, and geothermal development in practice. Future research should prioritize: projects studies measuring the socio-economic impacts of the Petrotrin closure on Southern Trinidad communities; comparative analysis of Caribbean Small Island Developing States, particularly Barbados, Jamaica, and Guyana, investigation of community-owned renewable energy models in small-island contexts; quantitative analysis of the relationship between procedural inclusion and transition readiness across petro-states; and empirical research on the distributional and procedural dynamics of solar and wind project siting as T&T's renewable sector develops.

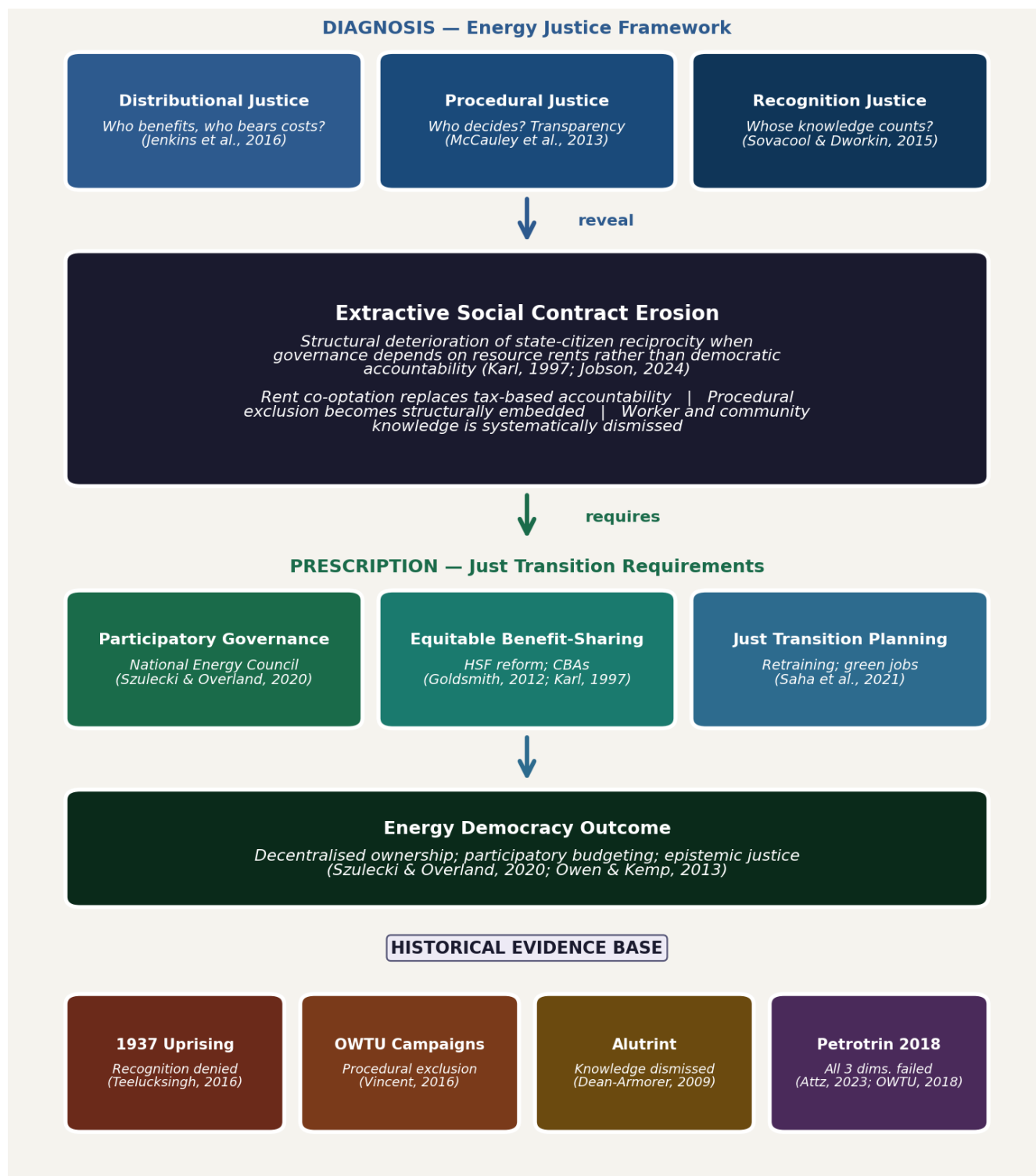


Figure 5. Conceptual framework: energy justice, social contract, and just transition

10. Conclusion

The 169-year history of T&T's hydrocarbon sector is not a story of uninterrupted progress or simple exploitation. It is a history of genuine developmental achievements alongside persistent structural failures in distributional equity, democratic governance, and recognition of marginalized communities. The analytical lens of energy justice makes visible what a focus on aggregate economic performance would obscure: that the costs and benefits of extraction have been distributed markedly unevenly, and that the victims of this unevenness have rarely had meaningful recourse. The trajectory from colonial extraction through nationalist developmentalism to neoliberal restructuring and contemporary fiscal fragility illustrates the difficulty of sustaining any social contract built on rentier foundations. Each phase produced its own version of the petro-state masquerade. The 2018 Petrotrin closure was the most recent and visible instance of this performance failing. The annual marches commemorating that closure demonstrate that the sense of betrayal persists. A transition framework that does not begin by acknowledging this legacy is unlikely to secure the public consent on which implementation depends. What distinguishes the current moment from previous crises is the presence of both necessity and opportunity. The global transition to renewable energy creates the conditions for a fundamental renegotiation of the social contract. EnergyPLAN modeling has demonstrated that the technical pathways are feasible: blended deployment of 400 megawatts of solar PV and 200 megawatts of wind emerges as the near-term optimum. The Brechin Castle solar project, already operational, proves that utility-scale renewables are viable in T&T's context. The governance question, by contrast, remains open. The alternative outlined in this review requires a statutory National Energy Council with genuine decision-making authority; Community Benefit Agreements that make redistribution automatic rather than dependent on political will; a just transition framework designed with the participation of trade unions and community organizations rather than delivered to them; and energy democracy understood as an institutional reality in which the knowledge of workers and communities is treated as authoritative. These are not utopian demands. Norway's tripartite bargaining structures, Scotland's Just Transition Commission, and Alaska's PFD demonstrate that such institutions are practicable in resource-dependent economies. The structural pressures will not ease. International climate commitments, mature field declines, cross-border geopolitical dependencies, and persistent foreign exchange constraints constitute challenges that the current model has no adequate answer for. The scientific and technical knowledge required for decarbonization is already available. The unresolved issue in Trinidad and Tobago, as in many petro states, is the need for a democratic transition that genuinely includes affected people. Energy justice is the starting point for a sustainable transition.

Ethical issue

The author is aware of and complies with best practices in publication ethics, specifically regarding authorship (avoidance of guest authorship), dual submission, manipulation of figures, competing interests, and compliance with research ethics policies. The author adheres to

publication requirements that the submitted work is original and has not been published elsewhere in any language.

Data availability statement

The manuscript contains all the data. However, more data will be available upon request from the corresponding author.

Conflict of interest

The author declares no potential conflict of interest.

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