JUST TRANSITION PROJECT PIPELINE

A framework to think about how financial, development and government sector players can build a more robust pipeline of Just Transition projects in South Africa

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JUSTSA

On behalf of:

Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety of the Federal Republic of Germany

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ABOUT JUST SA

This publication is a product of the Just Transition to a Decarbonised Economy for South Africa (JUST SA) Project. JUST SA is a project funded by the International Climate Initiative (IKI) through the German Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN) and with the Department of Forestry, Fisheries and Environment (DFFE) as the political partner.

JUST SA is implemented through a consortium led by the Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ) and comprises of the Trade & Industrial Policy Strategies (TIPS), the National Business Initiative (NBI), and the World Wide Fund for Nature (WWF SA). JUST SA is implemented in close collaboration with the Mpumalanga Green Cluster Agency and Indalo Inclusive. The project also collaborates closely with critical national and provincial stakeholders, including the Presidential Climate Commission (PCC), the Just Energy Transition Project Management Unit (JET PMU), the Mpumalanga Provincial Government, and other key partners to ensure a coordinated and inclusive transition process.

The JUST SA project supports the implementation of pathways towards a Just Transition to a low-carbon economy and climate resilient society taking a multi-level approach.

At national level, the project contributes to the implementation of key policy documents and facilitates dialogue forums and information sharing among multiple stakeholders, ensuring an inclusive and results-oriented process.

At provincial level, the project assists stakeholders in Mpumalanga to initiate alternative development pathways for a diversified regional economy, while also building the capacity of targeted SMMEs to unlock their growth potential and Improve access to finance.

At the local level, just transition activities are established in selected municipalities, empowering affected communities and marginalized groups through inclusive, bottom-up approaches to community development.

Furthermore, solutions to sustainably rehabilitate coal mining land and water are sought through collaborative research, policy implementation and community engagement.

For more information, visit: justsaportal.org.za, or contact us on justsa@giz.de

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About Trade & Industrial Policy Strategies

Trade & Industrial Policies Strategies (TIPS) is an independent, non-profit, economic research institution established in 1996 to support economic policy development. TIPS undertakes quantitative and qualitative research, project management, dialogue facilitation, capacity building and knowledge sharing. Its two areas of focus are trade and inclusive industrial policy; and sustainable growth.

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List of Abbreviations

DFI	Development Finance Institution
JEPT	Just Energy Transition Partnership
JTF	Just Transition Framework
III	Impact Investing Institute (UK)
IT	Information Technology
NGO	Non-Governmental Organisation
PCC	Presidential Climate Commission
R&D	Research and Development
SIC	Standard Industrial Classification
SEI	Social, Environmental, and Institutional
SMEs	Small and Medium Enterprises
SMMEs	Small, Medium and Micro Enterprises
SOE	State-Owned Enterprise
UK	United Kingdom

Introduction

The Draft Just Transition Finance Mechanism published by the Presidential Climate Commission (PCC, 2023) describes the three overarching challenges facing Just transition finance in South Africa as: 1) the absence of a cohesive and universally accepted definition of the just transition, resulting in varied interpretations and understanding; 2) the lack of a viable project pipeline, coupled with insufficient project preparation support that hinders the development of potential interventions; and 3) a discernible mismatch between available funding sources and the specific requirements of just transition projects.

This research focuses on the second identified challenge, the lack of a just transition project pipeline, while noting that the three issues are deeply interrelated. As with other areas of just transition finance research, a tension exits between the urgency for short-term interventions to support action on the ground, and the need to ensure that problem analysis, foundational understanding and the resultant short-term actions provide a path to the longer-term requirement of system level change (Naidoo 2021, PCC 2023).

Many financial and developmental actors are operating in the just transition pipeline space, offering different financial and support services at various points along the pipeline to achieve their internal mandates. Many of these are successful interventions. However, the fragmented and uncoordinated manner in which these activities occur is *unlikely* to result in large-scale, short-term opportunities or the system level change necessary to deliver the economy-wide just transition that South Africa requires.

Many financial and developmental actors are operating in the just transition pipeline space, offering different financial and support services at various points along the pipeline to achieve their internal mandates. Many of these are successful interventions. However, the fragmented and uncoordinated manner in which these activities occur is unlikely to result in large-scale, short-term opportunities or the system level change necessary to deliver the economy-wide just transition that South Africa requires.

Key fragmentation risks going forward include: i) an inability to scale up pipeline support actions to a level sufficient to support alternative livelihood and job creation opportunities for those negatively impacted by the transition; ii) an inability to support the necessary breadth of portfolio of just transition projects such that economic diversification and new emerging sectors remain underdeveloped, or developed in a manner which is not just; iii) the likelihood that resources are disproportionately allocated to some project originators[1] at the expense of others even if this results in consistently sub-optimal national socio-economic and climate improvement outcomes; and iv) the likelihood that current interest, goodwill and commitment to delivering just transition projects decreases.

Key to the research methodology is the view that South Africa will require a highly differentiated and heterogenous portfolio of just transition projects. Projects in all sectors, originated by all manner and sizes of firms (multinational, large, small), institutions and individuals with different ticket sizes and levels of profitability will all have a role to play. The country will also require projects to support an enabling environment for low carbon and just projects to gain traction and succeed.

In a contribution towards dialogue and thinking to increase co-ordination and alignment, this paper gathers insights into the pipeline barriers encountered by a wide range of just transition project originators. The research is driven by the argument that an evidence base of the universe of barriers to all projects entering and advancing through the just transition pipeline presented in an accessible manner can assist in the generation

1 *A project originator is the individual or organisation that has created a project that seeks to enter the just transition project pipeline. An originator may be an entrepreneur, small, medium and micro enterprises (SMMEs), a large corporate, community organisation or a foundation, donor or Development Finance Institution (DFI).*

of aligned and co-ordinated, bespoke and nuanced pipeline building activities, which will result in a more robust and responsive just transition pipeline that serves the needs of funders/financiers as well as stakeholders/ beneficiaries. Barriers include anything a project originator/driver/champion feels impedes their process to progress their project through the just transition project pipeline. The research offers a “barrier categorisation” which serves to bring structure and coherence to dealing with the complexities of supporting a pipeline of highly heterogenous projects and different types of originators.

These barrier categorisations are used as building blocks for a conceptual framework. **The intention is that the framework can assist financial, developmental, and government actors to understand their organisational mandates and position their individual project pipeline financial or support activities in a broader just transition pipeline barrier context.** This can facilitate decreased fragmentation, duplication and increased focus on existing gaps. Over time this can facilitate greater alignment and coverage, resulting in a more robust pipeline.

This paper is informed by existing local and international just transition literature and complemented by primary data collected from interviews with project originators and development and finance players who provide a variety of resources and services to such originators. The framework is presented as an aide to understanding and decision-making rather than providing a singular interpretation or any answers.

Section 2 begins with the challenging issues of just transition project pipeline parameters and definitions. The paper builds on previous work completed by TIPS, specifically the project portfolio work in the Just Transition Finance Roadmap (Lowitt, 2021) and the definitional work of the just transition tagging tool (Lowitt, Mokoena, Steuart, 2023; Lowitt, 2024). The research accepts that no shared view exists and that the definitions and parameters used in the research to provide internal consistency and common language are contested.

Section 3 presents the pipeline builder conceptual framework, which marries the just transition project barriers identified and categorised in the interview process with the broad project portfolio approach advanced in the TIPS Just Transition Finance Roadmap and Just Transition Tagging Framework. The quadrant framework facilitates barrier categories to be considered *simultaneously* with the type of originator enterprise type, and the sector/market in which the project will be implemented. This *multivariable approach* supports a richer understanding of the complexity of the universe of just transition project pipeline barriers and the differentiated actions required to support a more robust pipeline.

Section 4 presents thinking about possible solutions and activities that could build a more robust pipeline of just transition projects in South Africa. The section covers responses to some of the key barriers and offers both ad hoc (short term) immediate possibilities to resolve a given issue, as well as more sustainable (long term) system level change activities. The paper concludes in Section 5.

Just Transition definitions and parameters

The aim of a just transition is to ensure that the burdens and benefits of the low carbon transition are equitably shared, and development outcomes maximised. Locally and internationally just transition thinking pays particular attention to local communities and workers who are most vulnerable to climate change and least resourced to manage such change.

In 2021 the Presidential Climate Commission (PCC) commissioned work to formulate a Just Transition Framework (JTF) for South Africa. The Framework published in 2022 (PCC, 2022) advanced the principles of distributive, procedural and restorative justice as the cornerstones to a transition towards an environmentally sustainable economy and society in South Africa.

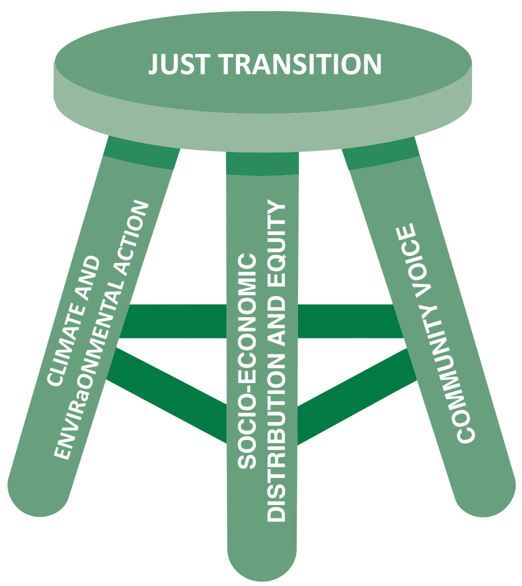
Restorative justice aims to address the historical economic, environmental and social losses incurred against individuals and communities under extractive industries, and to provide redress for these harms (Montmasson-Clair, 2021). Distributive justice demands that the risks and opportunities presented by the low carbon economic transition be shared equitably and requires interventions and policies that equip citizens and various spheres of government with the support and capacity to participate in the economy that the country is transitioning into (Montmasson Clair, 2021; PCC, 2024; JETP, 2023). Procedural justice emphasises bottom-up approaches and stakeholder engagement so that those most vulnerable and affected by the transition define their own needs and futures.

While these dimensions of justice frame the country’s ambitions in the transition it seeks to realise, translating the framework into a common practical understanding of what counts as a just transition project and how to evaluate, allocate and deploy resources to such projects is a substantial hurdle. This lack of a common and practical understanding of what projects or investments are “good enough to count as just” is a key inhibitor to the mobilisation and deployment of just transition finance and support services.

At the same time as the PCC was developing the dimensions of justice approach, the G7 Impact Task Force published its *Mobilising Institutional Capital towards the Sustainable Development Goals (SDGs) and a Just Transition Report* (G7, 2021) to begin working on a definitional approach. This culminated in a Just Transition Blueprint and conceptual guide aimed at assisting G7 partner countries to develop a **shared u**nderstanding of what a just transition entails. The blueprint articulates a just transition as comprising three elements: (1) advancing climate and environmental action; (2) improving socio-economic distribution and equality; and (3) community voice. Visually it is presented as a three-legged stool with a just transition intervention or project requiring all three legs of the stool to be in place to count as good enough to be just.

Diagram 1: G7 Three-Legged Just Transition

The Three Just Transition Elements



Source: G7 Impact Taskforce Report, 2021

In 2023 the United Kingdom (UK)’s Impact Investing Institute (III) working in collaboration with the private financial sector further developed the G7 blueprint to produce its *Just Transition Criteria* report (III, 2023). The report was the first annotation and definition of what “good looks like” in the context of a just transition investment.

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The report lists criteria which should be considered, and which establish the parameters of each of the three legs of the G7 just transition stool. The criteria serve as a guide for fund managers to structure and assess investments that align with just transition principles. They provide detailed guidance on: articulating product-level commitments; establishing disclosures and indicators to prevent harm; and defining key performance indicators to demonstrate positive contributions to a just transition. The elements are designed specifically to be applied alongside existing sustainable finance standards.[2] This is done to ensure broad applicability across geographies, investment strategies, and asset classes and importantly to enable interoperability.

The seminal contribution of the III was noted in South Africa. In 2023 a report commissioned by the PCC*, Funding social justice in the energy transition – A role for private sector financing at scale,* (Krutham, 2023) suggested that South Africa should adopt the III framework specifically because of the benefits of alignment and interoperability, which it argued would support capital inflows for the just transition.

In a TIPS report in the same year, it was suggested that the III framework is a crucial starting point, but when applied in the South African context could be made more relevant and useful without decreasing interoperability (Lowitt, Mokoena, Steuart 2023). This led to the TIPS just transition tagging tool (referred to as the tool), which is used as the definition for a just transition project for this report (Lowitt, 2024).

Using the tool, the research requires a project to meet four eligibility criteria to enter a just transition project pipeline. Each criteria applies nuanced and varied requirements, depending on a project's characteristics, but in a manner which is internally consistent and rigorous.

The first criterion is that a project may not be a new fossil fuel investment or an investment in the armaments, tobacco or sex industry. Bar these exclusions a project may be in any real economy or service sector. A project must also comply with the South African Constitution and all relevant laws and regulations.

The second eligibility criterion to enter the just transition project pipeline is that a project must be more than an idea. This is a hard criterion to judge, especially across heterogenous projects and different project originators. The tool requires some demonstration that: i) an idea has been stress tested within an organisation or community and given a green light from an appropriate structure;[3] ii) that some idea development has been undertaken either in the form of research or lived/demonstrable experience; and iii) that some resources have been applied to teasing out the idea. These resources applied to deepening an original idea include everything from corporate budgets, to grant allocations, to sweat equity, and loans from friends and family.

The third criterion relates to financial sustainability. To enter the just transition project pipeline, a project is required to meet an extremely low threshold.[4] It must simply show that it is not *designed upfront* to require ongoing finance to be sustainable. The tool and pipeline eligibility criteria used in the research is agnostic in the rate of return of the investment, whether the investment will be likely to succeed or not, or how the in-vestment will be funded (bended, loan, debt, grant, balance sheet etc). The criterion also does not discriminate in ticket size and project scale. This low threshold allows and supports both a wide array of projects and project originators, and is specifically designed to give effect to the heterogenous portfolio of just transition projects identified in South Africa. The decision to invest or support a project remain solely at the discretion of the third party.

The final criterion is the most complex and relates to the tool's definition of what counts as a just transition project in the South African context (TIPS, 2024: Just Transition Tagging Tool). The TIPS tool applies a bespoke application of a menu of just transition criteria based on a project's fundamental characteristics.[5]

2 Sustainable Finance Disclosure Regulation.

3 Special allowance is provided for individual entrepreneurs.

4 Being eligible to enter the pipeline and actually attracting funding are viewed as separate issues in terms of definitional parameters. Essentially the only projects ineligible to enter the pipeline are projects such as social safety nets and public employment schemes as they are designed to depend on recurring budget allocations or grant funding.

5 The project categorisation system takes into account: geography of the project (place based v non place based); nature of the project (enabling project v tangible project); project life cycle phase (proof of concept, preparation, implementation); type of organisation (DFI, SMME, large enterprise, community structure etc); primary purpose of the project (socio-economic improvement or climate/environment).

To be just, all eligible projects must include both socio-economic improvement and climate/environmental action elements. However, different weightings (hurdle rates) are applied based on a project's design characteristics. For example, a project which has as its primary purpose socio-economic improvement would need to meet a high socio-economic improvement hurdle rate but a lower green hurdle rate. Conversely a project designed specifically to provide climate outcomes would have to meet a high green hurdle rate and a lower socio-economic improvement hurdle rate.

To enter the just transition pipeline a project should include climate/ environmental (green) action, socio-economic improvement impacts and include community voice.

In relation to community voice the requirement to consult and communicate with impacted communities and stakeholders is also nuanced based on a project's characteristics. For example, a project which is only at a proof of concept stage in its life cycle does not need to include community voice activities to qualify as just, because such consultation could create unrealistic expectations in the local community and reputational risk to the company/entrepreneur undertaking the research if the concept turns out to be unviable. However, once a tangible project on the ground is ready for implementation it would need to meet the highest hurdle rate of having a community engagement policy, budget, action plan and completed interactions with impacted community members.

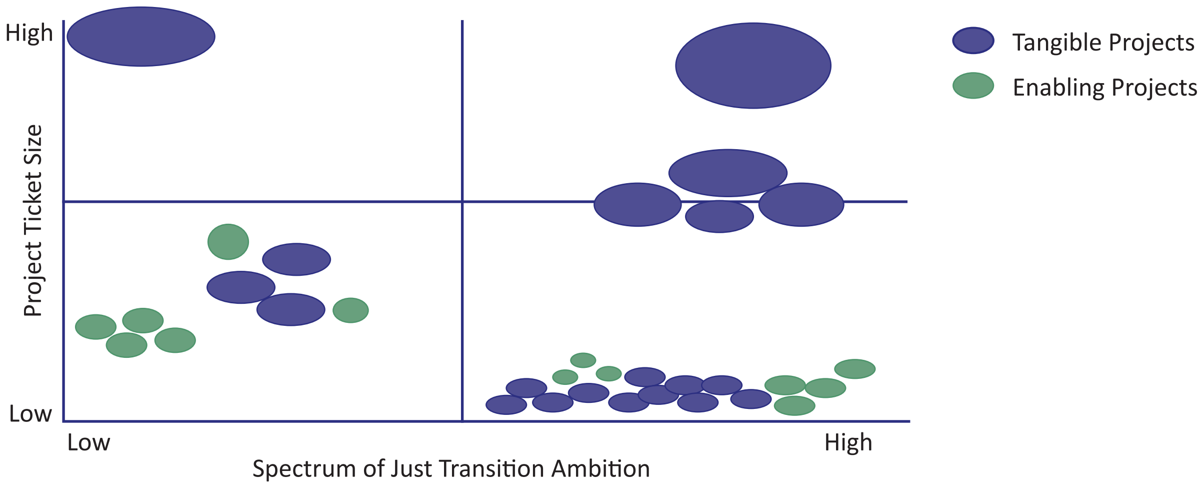
As such, to enter the just transition pipeline a project should include climate/environmental (green) action, socio-economic improvement impacts and include community voice. The key exception to these three requirements relates to what is termed enabling projects.

The G7 three-legged stool and III approach are designed from a Global North perspective to support tangible investments in a transition to a low carbon economy. In the Global South, an enabling environment for such a transition is often lacking. As such a just transition project definition in the Global South must include criteria which allow projects that contribute to creating an enabling environment for just transition tangible investments to be counted as just. This is necessary so that such enabling projects are eligible for funding and count towards organisational and national just transition support targets and mandates. In South Africa for example there is substantial demand for: municipal capacity building and green industry regulatory and legislative development to improve the country's enabling environment to deliver a just transition. None of these activities comply with the three legs of the G7/III approach and would thus not count as just in the Global North. The tool used in this research sets criteria for enabling projects and does count projects which meet such criteria as just transition project which are eligible to enter a just transition pipeline.[6] This is crucial as foreign governments, foreign DFIs and Just Energy Transition Partnership (JETP) investors are willing and able to provide such enabling support.

Using the definitions provided by the tool, TIPS has undertaken multiple research efforts to monitor a broad array of eligible just transition projects. Diagram 2 illustrates a broad array of projects currently at various stages in the local just transition pipeline. The diagram is provided to highlight the heterogeneity and diversity of projects being thought about and implemented in South Africa. This reinforces the need to adopt *a portfolio* approach to building a just transition pipeline and to deliberately embrace the complexity and differentiation which will be required in designing any pipeline builder programme. The diagram is based on previous research and does not represent the sample used in this research which is presented in Section 3.

6 *An enabling project is defined as: A project which supports or capacitates public servants, public sector organisations and their agencies and not for profit organisations in non-commercial activities that will create a more fertile environment for just transition project development and implementation in the future. In the definition, an enabling project is limited to application in the public sector and not for profit sector. It must be non-commercial, i.e. its immediate outcome does not generate an on-going revenue stream. It must be designed and have as its fundamental objective the creation of a more fertile environment for either just transition project development or just transition project implementation.*

Diagram 2: Just Transition Project Clusters



Source: Lowitt, Mokoena, Steuart ,2023, updated Lowitt, 2025; 2021 data based on self-assessment; 2025 data based on tagging tool and includes enabling projects previously excluded.

The uppermost circle in the top left of the diagram represents a tangible project originated by a state-owned enterprise (SOE) with a ticket value of over R100 billion focused on a pioneering alternative energy source. This project has not been designed to deliver a high, direct socio-economic improvement impact but will provide new employment opportunities for some workers displaced by the company's transitioning decisions. It is envisaged to be funded using blended finance, with some initial work requiring grant funding and policy support programming. The project is designed to provide an above-market return and may create downstream opportunities which will increase its socio-economic benefits in the medium to long run.

In contrast, the cluster of small circles in the bottom right corner represent a large number of projects specifically focused on providing positive short-run, socio-economic outcomes for individuals and communities negatively impacted by the transition out of fossil fuels in specific geographic locations. One such project is a microenterprise which seeks to use discarded tyres from large mining equipment to make recycled roof tiles for the low income and informal housing market. The community co-operative would provide employment for eight people at a survivalist level. The project requires a once-off capital investment of R400 000 to get the enterprise started, after which it is planned that sales will provide a sufficient revenue stream to pay wages and maintain equipment. Given governance and credit track record limitation the project would require grant funding.

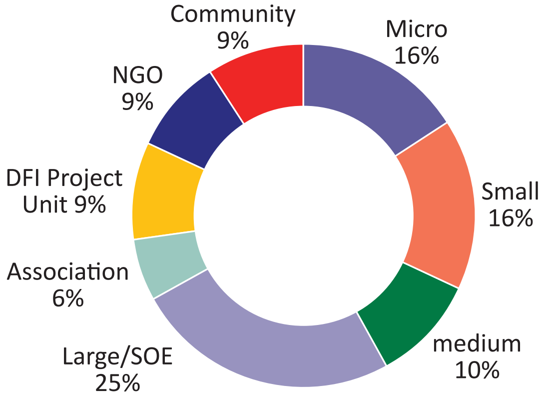
The top right projects represent the elusive unicorns of just transition projects. They offer high, long-term market returns, and have strong socio-economic and green credentials. The projects are all driven by listed private sector companies and are of ticket sizes, making them attractive to the local private financial sector.

In relation to enabling projects (light blue circles), projects on the lefthand side are characterised by policy and government support projects predominantly financed and operated by Global North DFIs and in some cases by Global North governments through their embassies. One example is a Global North government with extensive knowledge of a particular alternative energy providing the South African national government with technical support to draft a regulatory framework. In another example, a DFI is assisting sub-national government structures with capacity building, strategy development, modelling and systems design to allow these structures to better support tangible just transition investments in their jurisdictions. Enabling projects on the right of the diagram predominantly represent community level programming by foundations, non-governmental organisations (NGOs), civil society organisations, local and municipal governments, local and foreign development agencies, and financial ecosystem players. Almost all the projects are focused on skills development, training and capacity building for narrowly focused groups of beneficiaries.

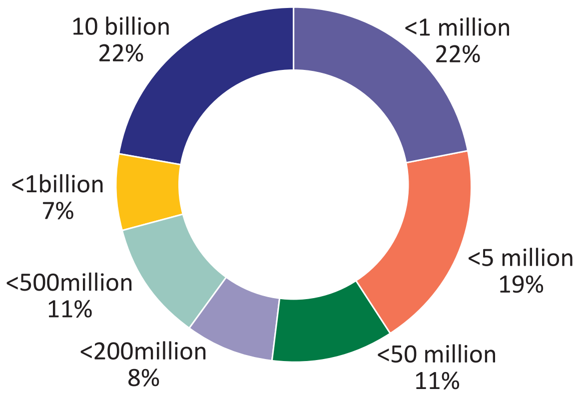
Pipeline builder conceptual framework

Based on the foundations in Section 2, the research identified an interview population that reflected all the aspects of heterogeneity identified in the just transition research to date. TIPS reached out to over 100 potential participants who represented project originators/drivers from: 1) all types of organisational types and sizes (large listed companies to small community co-operatives); 2) all Standard Industrial Classification (SIC) codes (agriculture to energy to services); 3) projects at all stages of their life cycle (from proof of concept to shovel ready); 4) all ticket prices (multi-billion Rand projects to less than a million Rand). The public sector was excluded except for SOE. A total of 47 semi-structured interviews were eventually conducted. The make-up of the final sample is shown in Graphs 1, 2 and 3.

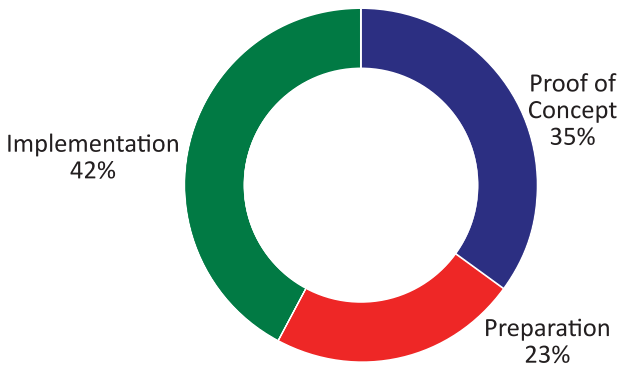
Graph 1: Distribution of Sample by Type of Organisation



Graph 2: Distribution of Sample by Ticket Size (Rands)



Graph 3: Distribution of Sample by Phase of Project Development



Source for Graphs: Author

Interviewees were asked to articulate the key problems/ barriers they faced in progressing their just transition projects. Follow-up questions were asked to ensure that the barrier was captured as clearly and specifically as possible. The team attempted to capture barrier articulations verbatim, using the words and vocabulary of the interviewee. These barriers were entered into a master list and coded. After filtering for duplication, 159 specific barriers were identified which created the basis for all subsequent analysis and conceptualisation.

The barriers were extensively workshopped against the characteristics of the projects (size of investment, sector, sector characteristics, project life cycle phase, nature and aim of the project, type of organisation, size of organisation, formality of organisation etc). Patterns were sought to add value to how the master list of could be understood. This resulted in the conceptual framework presented in this report.

Analysis of the data revealed that *two* variables most strongly *and simultaneously* influence the *nature* of the barriers facing a local just transition project originator. The first is the "newness" of the sector is in which the project is being developed or rolled out. Originators in sectors which are relatively well understood commercially, financially, technically and in terms of an existing legislative and regulatory environment articulated similar just transition barriers. These barriers are different to the barriers articulated by project originators operating in sectors and industries which are new, largely unknown commercially, poorly understood technically and lack an enabling environment. While this is a mainstream economy problem which exists for any project it is *a standout* feature specifically in relation to projects which are driven to transition out of the old way of doing things into the new way of doing things both in terms of climate action and their things both in terms of climate action and their approach to growth and inclusion. The complexities of newness and a usable.

The second dominant variable impacting barrier relates to the originators' level and access to resources. These are *not* limited to funding and finance but include non-monetary resources such as information, networks, governmental support. These barriers are faced in all pipelines, but the requirement for a just transition project to meet *all three elements* of climate/environmental, socio-economic improvement and community voice actions elevates the importance of resource-related challenges and specifically how these are defined and articulated (see Table 2). Based on interviews and data it is the **simultaneous impact** of newness and access to resources that provides the greatest insight into understanding why project originators struggle to get projects into, or progressed along, the just transition pipeline and why the South African just transition project pipeline lacks robustness. To incorporate this *simultaneous* impact of newness and enterprise resources a two axis four quadrant model is developed. Newness is defined in Table 1 and represented on the horizontal axis. Enterprise resource is defined in Table 2, represented on the vertical axis.

Newness

There is no consensus definition or language which captures newness and the multifaceted aspects of new endeavours across multiple sectors in the economy. Words such as novel, nascent, established, traditional, pioneering all have different connotations and meanings across SIC codes (mining versus IT) and in different communities (academia versus banking). In searching for definitions and language appropriate to cover the broad portfolio of projects identified in South Africa and the interview sample a composite approach has been developed. Language and scale criteria are drawn from NASA's 1960's Technology Readiness Level used to develop the supply chain to support the moon landing (cited in Mankins, 1995); the Multidisciplinary Digital Publishing Institute (MDPI's) Green IT maturity Index which measures the readiness of a firm to incorporate 4th industrial revolution processes (Salles et al. 2022); OECD's Transformation Readiness Index (cited in Domil, 2022) and Mazzucato's work on pioneering sectors and the entrepreneurial state (Mazzucato, 2013).

Table 1: Characteristics of Newness of Sector Definitions

	ESTABLISHED SECTOR	NOVEL SECTOR	NASCENT SECTOR	PIONEERING SECTOR
TECHNOLOGY				
Patents (number)	Large	Medium	Few	None
Novelty in Recombination (how often is a new technology used with existing technology)	High	Medium	Low	None
MARKET STRUCTURE				
Competitive Landscape (number of large incumbents v number of smaller companies)	Lots of large companies; few smaller enterprises	Some large companies more smaller enterprises	Few large companies dominated by smaller companies	Government research and or visionary individuals
Business Model (how well is the business under-stood by 3rd parties)	Well understood	Evolving understanding	Limited to no understanding	No understanding
MARKET PENETRATION	High	Growing	Low to none	None
ECOSYSTEM MATURITY				
Supply chain characteristics	Stable and well developed	Emerging and fragmented	Not present but there are sourcing opportunities	Not present. No existing sourcing opportunities
Standards and Industry Associations	Strong standards good institutional structures	Evolving standards and structures	Standards and structures are absent	Absent
Regulatory Landscape	Known and predictable	Developing and Uncertain	Largely absent	Totally absent
EXAMPLES (from Interview Participants)	Eco tourism Solar PV Goods made from recycled materials	Green cement Biofuels Hemp seed	Offshore wind Carbon capture and storage Green hydrogen	None in South Africa (international example Elon Musk's mission to Mars)

Source: Author

Four sectors are described in a continuum of newness from "established", which describes the least new sectors, through to "novel" then "nascent" and finally "pioneering".

Four sectors are described in a continuum of newness from "established", which describes the least new sectors, through to "novel" then "nascent" and finally "pioneering", which are the newest and least well understood of the continuum. Each of the four sectors are defined in terms of quantitative and qualitative measures (Table 1) that capture the state of technology, market structure and maturity of the ecosystem. Examples from interview participants are included in the last row of the table.

Enterprise Resourcing

Interview responses and data analysis suggest that, in the context of the South African just transition pipeline, the use of traditional enterprise measures such as turnover or number of employees is insufficient to capture the barriers project originators experience and struggle to overcome.

A composite enterprise resource scale is presented in Table 2 which seeks to add depth to understanding enterprise resources where the interplay of multiple characteristics is more important than an individual characteristic. The scale runs from "well" to "limited" resourced enterprises and is explained in Table 2.

Table 2: Characteristics of Resource Levels of Enterprises

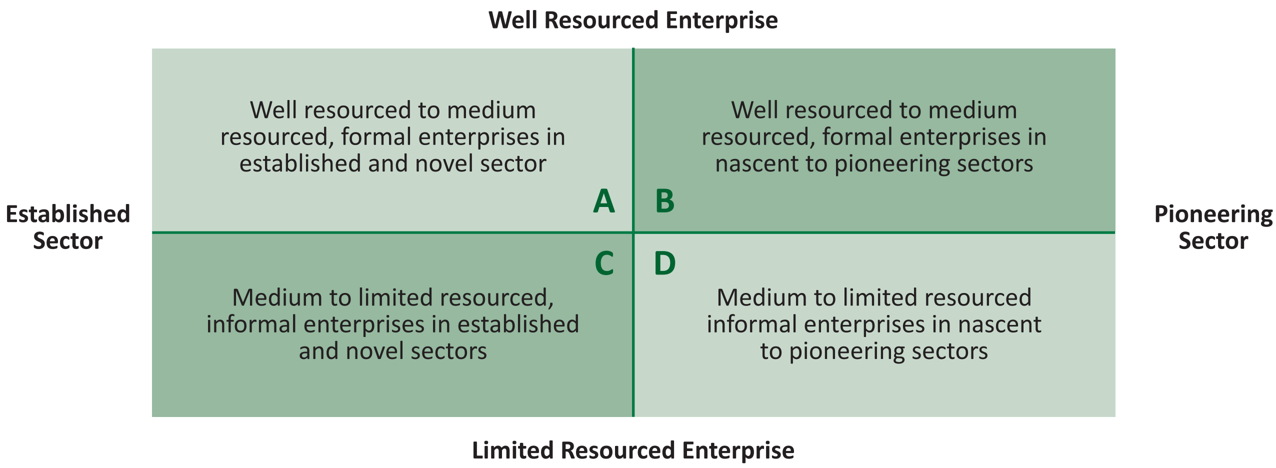
	WELL RESOURCED ENTERPRISE	MEDIUM RESOURCED ENTERPRISE	LIMITED RESOURCED ENTERPRISE
Human Capital			
Skills base (% of graduates in management)	High	Moderate	Low
Size of Workforce (number of employees)	Large	Moderate but in non-established sectors often small*	Small
Governance			
Juristic person	yes	Yes	No
External/ independent governance oversight	Almost always	Usually	None
Internal Systems			
Access to and use of IT	Ubiquitous and stable	High and consistent	Low and inconsistent
Standardised Operating Procedures	Widespread often digital	Fragmented	Absent
Access to Financial and Support Ecosystem**			
Credit and Finance track record	Yes	Yes	No
Financial literacy/sophistication	High	Variable	Low
Ease of interacting with 3rd parties/ agency (ability to collaborate, partner, absorb external assistance, transact)	high	Medium but often con-strained	Weak
Examples (from interview sample)	Listed Companies, State Owned Enterprises	Unlisted Companies, Partnerships, Closed Corporations, Sole Proprietor, NGO's, NPO's	Informal Enterprises, entrepreneurs and community groupings

*Source: Author. *A traditional large and SMME categorisation was not possible because of the high incidence in the sample for well- resourced enterprises with very small numbers of employees. This was particularly true in innovative green sectors. ** This factor includes non- financial ecosystem access issues as the re-search covers projects that are sustainable but not necessarily profitable, hence the ability to access govern-ment or technical support services for grant funding must be accounted for.*

Quandrant Model

Placing the vertical and horizontal axis together a four-quadrant model is created showing the interplay between "newness" and "resourcing" as key variables which simultaneously impact the barriers and challenges described by project originators trying place projects into, or progress project along, the just transition pipeline in South Africa.

Diagram 3: Conceptual Model



Source: Author.

Based on Tables 1 and 2, Quadrant A represents well to medium resourced enterprises, which are formalised and operate in established and novel sectors. Quadrant B represents similar formal, well-resourced enterprises but in this quadrant the just transition project for(or in) the pipeline is in a nascent or pioneering sector meaning that it is newer and less well understood than the sectors in Quadrant A.

Quadrants C and D represent medium to limited resourced enterprises which are often informal, but may include some legal partnerships or closed corporations near the intersection of the axes. In Quadrant C these medium to less well-resourced enterprises are originating or proceeding with projects in established and novel sectors, whereas in quadrant D such enterprises are seeking to originate projects in nascent and pioneering sectors.

The detailed barriers per quadrant articulated in the interviews are presented in Tables 3, 4, 5 and 6. They provide **an approach to thinking about the universe of problems that face a broad array of just transition project originators across a portfolio of projects**. The scope and complexity of the barriers highlight the scale of the challenges finance, development and government actors will need to collectively deal with if a robust just transition pipeline is to be supported in South Africa.

Quadrant A

Table 3 presents the granular pipeline barriers described by well to medium resourced enterprises with qualifying just transition projects in established and novel sectors. The standout nature of the barriers are that they involve the relational behaviour of third parties that fall outside the direct control of the enterprise originating and driving the project.

Table 3: Pipeline Barriers Faced by Well/Medium-Resourced Enterprises in Established/Novel Sectors

COMMUNITY VOICE
Identification of appropriate community grouping with which to deal
Trust deficit between community and enterprise
Community grouping governance and consistency of personnel involved in in engagements, negotiations and agreements
Changing and unrealistic expectations
Lack of follow through on commitments
INFRASTRUCTURE SUPPORT
Lack of physical municipal infrastructure to support projects
Lack of national and municipal policy to enable community benefits to be optimised
Lack of follow through on commitments of government
PENETRATION SUPPORT
Lack of Standards and Testing which limit on the ground adoption of new technology in established sectors and novel sectors
Lack of official recognition or support at government level which limits third party participation
RISK AND REPORTING
Perceived and real reputational risk
Disclosure and monitoring and evaluation

Source: Author, based on interviews with project originators.

Interview data in Quadrant A highlight barriers regarding community recognition and community fulfilment of agreements. Respondents in this quadrant report applying substantial resources to community engagement, community stakeholder identification, relationship building and informed consent. However, limited official guidance on community recognition definitions and weak community institutional and governance structures create a space where rent-seeking, vested interests, inconsistent and unpredictable delivery on agreements and representation disputes result in ineffective and failed enterprise-community collaborations. The barrier was described as a fundamental "deficit in trust" by multiple respondents.

Related to a lack of mutual trust, several interviewees also raised the issue of the reputational risk attached to labelling a project as "just". Several respondents felt they were exposing their companies to unnecessary reputational risk by positioning their projects in a *just* pipeline as they could be accused of just transition washing by intended beneficiaries, unions, industry associations or the media. Due to the lack of a national definition and standards to define a just transition project some enterprises felt exposed and vulnerable to just transition washing accusations, especially in light of the low community trust and governance issues raised above. This is a very different situation to that in the UK, for example, where companies are rushing for first mover advantage in positioning themselves as embracing just principles (Robins et al., 2019)

Over and above relationship barriers with the community, well-resourced enterprises in Quadrant A also raised the issue of barriers in productively collaborating with municipal governments.

Respondents report that their just transition projects often require municipalities to deliver supporting infrastructure, access to existing infrastructure, planning, consent, permissions and approvals; or simply political endorsement and community relationship support. Well-resourced enterprises often provide human, technical and financial support to assist municipalities to meet these requirements. Interviewees report that local government officials often *do* agree to collaborate and deliver the necessary support to the project but fail to fulfil their undertakings even when the originating enterprise provide resources and capacity assistance.

Two common characteristics are evident in Quadrant A. First all the barriers are *external* to the enterprise. This means that the enterprises are not reporting barriers related to their internal processes and capabilities to deliver a just transition project, but rather external barriers that require the actions of a third party in order for the project to be originated and/or progressed. This means that the enterprise cannot use its resources (including all its [usually considerable] skills, finance and existing networks) to resolve the barriers. The second common characteristic is that all the barriers in the Quadrant A are about *relationships* and failures to establish effective, productive and predictable collaboration. This is an important point. In this quadrant the institutional, regulatory and legislative enabling environment are largely in place. The sectors are well enough understood that commercial, market and financial constraints are not binding. Rather it is effective relations and the delivery of collaborative arrangements and undertakings with spheres of government and communities that are the impediment.

In the sample, most Quadrant A just transition projects are already in the just transition pipeline but cannot make it "over the line" despite substantial resources having been applied to the project. Most of the projects are of a substantial scale, have high potential socio-economic impact, strong climate/environmental credentials, have invested in community voice and are supported by an enabling regulatory and legislative environment. Some projects in this quadrant could represent proof of concept or a benchmark for transitioning to a low carbon economy in a manner which is just; however, none can be progressed further without third party intervention. High levels of enterprise frustration threaten the on-going commitment to such initiatives and several respondents suggested that their projects would likely be shelved.

Quadrant B

The barriers to originating and/or progressing a project into the just transition pipeline for well-resourced enterprises in newer sectors (nascent and pioneering) are shown in Table 4. Similar to Quadrant A the nature of the barriers in Quadrant B are external to the enterprise and beyond their immediate control. However, in Quadrant B the barriers are not related to relationships and collaboration but the absence of an enabling en-vironment, which makes it difficult to originate/process and/or implement just transition projects in newer sectors (as defined in Table 1). This lack of an enabling environment includes barriers to regulation, legislation and in more pioneering sectors – basic signalling of how much appetite the government has to see certain potential sectors be pursued.

Table 4: Pipeline Barriers Faced by Well/Medium-Resourced Enterprises in Nascent/Pioneering Sectors

LACK OF ENABLING ENVIRONMENT
Inconsistent or missing national approach and signalling in nascent and pioneering sectors
No clear and predictable national approach to "making markets"'
Lack of processes to start thinking about legislation
Where legislation exists regulatory gaps limit progress
Misaligned legislation and regulations across sectors which inhibit new value chain creation
Missing processes or approaches to future processes which hinder understanding of sector feasibility
Vested interests in maintaining the status quo
Lack of public sector support services that facilitate private R&D
Insufficient incentivisation and risk reduction/sharing

Source: Author, based on interviews with project originators.

The barriers reported in the quadrant cover a broad range of challenges. Originators in nascent sectors reported that often the legislative enabling environment is actually in place to support their projects but that supporting regulations are either missing, or if present, are not being institutionalised, resourced or implemented. This means that project originators are often ready to progress their projects but a simple missing process action from a government department or agency puts the brakes on their project. Respondents reported high levels of frustration that simple administrative inefficiency (or some suggested a lack of will) is hamstringing projects specifically in sectors which the government itself has earmarked as important growth opportunities for inclusive economic diversification in the transition away from fossil fuels.

Project originators with projects that fall into sectors which are “newer” than nascent sectors raise more existential enabling environment barriers. The project originators operating in “very nascent to pioneering“ sectors understand that they are developing their projects in advance of an existing enabling environment. The barriers they raised did not relate to requiring an enabling environment to be in place immediately, but rather to have more confidence that the authorities are committed to’, and to have a plan to bring such legislation into force in a knowable timeframe. This is often done in other countries by governments issuing a high- level roadmap (communique) which conveys at a high level its position on a nascent or pioneering sector, how it views the potential of such a sector, and how an enabling environment process could potentially be supported and the role the government would need to play. Project originators in South Africa raised granular issues such as a lack of process and the stalling of some existing legislative developments which would signal openness to supporting nascent opportunities. Inconsistent championing and messaging within and across government, and finally a lack of local capacity and technical skills to create roadmaps and a lack of collaborating with international experts to learn from and fast track such roadmaps.

For one originator (with a very high-risk appetite in a pioneering sector), the barriers were simply that they were unable to obtain any signal, intent, communication or engagement with authorities in relation to the project they wished to pursue.

The common thread across the quadrant is uncertainty regarding the intent and commitment of the government to create an enabling environment in nascent and pioneering sectors. This uncertainty creates project risk which even the most well-resourced enterprises cannot price into their project or seek to ameliorate. Frustration levels are high for enterprises in Quadrant B, especially those which are actively working on just transition project in nascent sectors that have been highlighted by national and sub-national government spheres as offering high levels of opportunities in the country’s transition from fossil fuels. Interviewees differed in their perceptions of why such barriers exist. Some put it down to administrative incompetence, others believed the government is paying lip service to certain greening opportunities but wished to maintain the status quo, while other believed the barriers exists because of capacity and technical limitations.

Project originators are often ready to progress their projects but a simple missing process action from a government department or agency puts the brakes on their project.

As in Quadrant A, some respondents in Quadrant B suggested that their projects would be shelved despite years of development and substantial resources being applied.

Quadrant C

Quadrant C represents the just transition pipeline barriers experienced by medium to limited resourced enterprises operating in established and novel sectors. These enterprises tend to be informal, have limited financial resources and credit track records, lack governance structures and internal business systems, and have limited contracting and networking capacity and capabilities (Table 5). Of the four quadrants in the framework Quadrant C is the most well researched and best understood quadrant in South Africa in general, and in particular in relation to the just transition (NBI, 2015; Makgetla, 2020; NDP, 2012; Valodia, 2012; Hattingh, 2022). Anecdotally Quadrant C appears to be the focus of the majority of existing just transition pipeline support programming and research, funding and financing at this time.

Table 5: Pipeline Barriers Faced by Medium/Limited-Resourced Enterprises in Established/Novel Sectors

SCOPE
Lack of knowledge about what counts as just transition
Lack of knowledge about non-core project element (SEI – Social, Environmental, and Institutional – element if a green project or green element if it is an SEI project)
Lack of resources to incorporate delivery of non-core element
Difficulty meeting community voice requirement
APPROPRIATE THIRD PARTY IDENTIFICATION
Lack of knowledge about who to approach to get the necessary assistance required (technical, support, funding or financial)
Lack of feedback, redirection or referrals
Limited resources to reach out to multiple parties
CREDIBILITY WITH THIRD PARTIES
Challenges in understanding terminology and application requirements
Lack of knowledge and research about market in which project sits
Lack of input suppliers
Unknown customer base and marketing approach
Incomplete project proposal
Lack of financial analysis
Lack of governance
Lack of processes
Lack of bank account or credit track record

Source: Author, based on interviews with project originators.

Table 5 shows that less well-resourced enterprises aiming to originate and/or progress just transition projects along the pipeline in established and novel sectors struggle with three key barriers: issues of scope (what is a just transition project); third party identification (who can I reach out to for help); and credibility hurdles (I cannot make progress because of my internal limitations). Only the first of the three barriers is unique to just transition projects. The latter two categories are common across all less well -resourced projects and are well -known and understood by practitioners in the broad SMME space. While it is an urgent national priority to resolve the barriers of third party identification and credibility barriers for *all* less well-resourced enterprises and *all* projects in South Africa, it *is cardinal* to do so in the context of a just transition. In *the specific context* of a just transition, the *systemic perpetuation of such barriers fundamentally undermines the entire basis of what is considered to be "just".*

Respondents in Quadrant C reported not having a good understanding of what differentiated a just transition project from a non-just transition project. For those who did understand and had a working knowledge of the three elements required to count as just, they reported that they had insufficient skills and/or resources to plan and manage multiple targets simultaneously within a single project. The barriers of delivering climate/environmental, community voice and socio-economic improvement actions *simultaneously* was viewed as unrealistic and unachievable by many of those interviewed. Social capital and standing in relation to community voice was also raised by multiple interviewees.

Respondents in Quadrant C also consistently cited barriers of: not receiving any response to their pipeline project submissions/applications and being denied access to funding and/or support services. These are the respondents' lived experiences. However, for the research at hand it was necessary to understand why respondents were not receiving feedback and why they were being declined finance, funding and support services to originate or progress their just transition projects.

By reaching out to the parties that the sample respondents had contacted (players in the developmental financial eco system) the research team were able to add a little more substance to the barriers facing enterprises in Quadrant C (as reported in Table 5).

The limited resourced enterprises in the sample reached out to finance and providers of project support ser-vices such as incubators and business development intermediaries based on word of mouth or internet searches. Most (but not all) of their outreach was in the form of unsolicited applications and proposals. When the players who received these proposals were tracked down and interviewed most of them explained that their mandates and specialisations were fundamentally mismatched to the needs of the project applicant.

This resulted in “application noise” from the perspective of the financial institutions and a “wall of silence” for the originator. In light of this information financial ecosystem literacy and a lack of appropriate referral/access information and systems appears to be a substantial just transition pipeline barrier in this quadrant.

When speaking to financial ecosystem players who *did* have a relevant just transition mandate and development specialisation, they reported that on the whole the just transition project proposals they received were of extremely poor quality, often lacked cohesion and cogency but most crucially provided an insufficient basis to support additional interrogation and assessment from a business, economic and/or sustainability perspective. The point emphasised in the interviews with *just transition project funders, financiers and service providers* working with less well-resourced enterprises in established and novel sectors was that these enterprises did not utilise *existing* basic business information, economic data and market dynamics to support their just transition project offerings. Generally, it was pointed out that originators failed to make a defensible business case at even a basic level. It was noted that in this quadrant such information does exist, but accessing it and using it in a manner which current just transition project financial ecosystem players can interact with was identified as the relevant barrier.

The nature of the barriers in Quadrant C are therefore fundamentally different to those of quadrants A and B as they are internal barriers not external barriers. In Quadrant C these internal barriers are dominated by a lack of knowledge and a lack of an ability to utilise existing knowledge and information in a manner which maximises opportunities in the current operations of the financial ecosystem.[7]

Quadrant D

Only one project originator fell into quadrant D. The less well-resourced individual has been working on a pioneering project. By definition knowledge and information about pioneering sectors is lacking due to their newness. Well-resourced enterprises with similar aspirations could apply substantial resources to scenario planning, modelling, extrapolation and adaptation of international technology to try to create a business case. By definition such activities are not available to less well - resourced enterprises, but the barriers identified by the respondent are included in Table 6.

Table 6: Pipeline Barriers Faced by Well/Medium-Resourced Enterprises in Nascent/Pioneering Sectors

Inability to access international intellectual property and negotiate licencing agreements
Limited resources to do R&D
Insufficient resources to model future scenarios
Insufficient network to credibly plan for required supply chain and auxiliary services necessary to make a feasible proposal
Inability to access financial ecosystem

Source: Author, based on interview with an individual project originator.

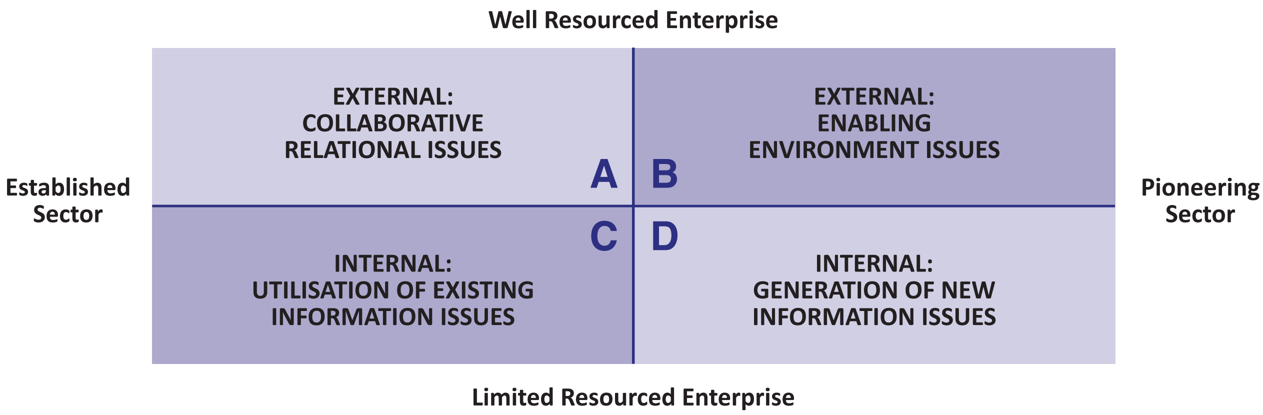
7 *As will be argued in Section 4, while in the current financial ecosystem the onus is on the project originator to meet the needs of existing financiers and support agencies, in the future it is necessary to think of system level change where the financial ecosystem adapts its service offering to existing demand characteristics.*

The nature of the barriers in Quadrant D are internal and relate to a lack of information and specifically an inability to generate the information necessary to being to originate a project.

Putting it all together: A conceptual framework of barriers which inhibit a more robust just transition project pipeline in South Africa

The framework (Diagram 6) offers a way of thinking about the barriers that heterogenous project originators face from a bird's-eye perspective but in a manner which supports deep dives into specific portfolios of projects in a collective manner. The intention of this multi layered conceptualisation is that the framework can assists financial, development and government actors to understand their organisational mandates and *position* their individual project pipeline financing and support activities in a broader just transition pipeline barrier context. This universal, bird's-eye view can facilitate decreased fragmentation, duplication and increase focus on gaps in existing pipeline finance and support offerings. This will enable improved alignment and coverage across the activities that are required to build a more robust just transition pipeline.

Diagram 4: Just Transition Pipeline Barrier Conceptual Model



Source: Author

At the same time, the details of the barriers captured in each quadrant can assist finance, development and government actors to design programming, mechanisms and instruments that are bespoke to specific types of project originators or sectors. It can support improved outcomes in the form of increased project lead generation, throughput, conversion rates, and the overall robustness and appropriateness of the local pipeline. The framework also supports thinking about the possibilities for an organisation's operations or mandate to consider programming across multiple quadrants simultaneously.

All of the thinking may assist in refocusing efforts to provide traction on the ground in the just transition space and actively support the roll-out of high quality benchmark projects which demonstrate what success can look like.

Thinking about solutions and actions to build a more robust just transition pipeline in South Africa

The framework and the barrier descriptions captured lead to the inevitable question of how to begin tackling these challenges and how the framework can assist in thinking about appropriate and deliberate interventions to build a more robust pipeline in the South African context. While these answers fall outside the scope of this paper (but will hopefully be progressed in follow-on research) some ideas were captured in discussions with project originators and financial ecosystem players in the just transition finance and support space. These ideas were workshopped by the researchers in the context of the framework and are briefly presented in this section.

Ideas to improve the pipeline of just transition projects in South Africa are presented *per quadrant* (Table 7). They are presented as *possible* recommendations that will require detailed follow-on research, and the list of options remains incomplete. Possible actions are divided into ad hoc and systemic actions. Ad hoc actions aim to provide quick responses that contribute to change on the ground in the immediate short term (but may not be sustainable and do not deal with the underlying cause of the barriers). Ad hoc recommendations are often not replicable, scalable or cost effective but are likely to deliver immediate impacts in lead generation, increased conversion rates and implementation. Ad hoc recommendations may also help provide traction for the domestic just transition agenda, provide success stories and benchmark case studies, and increase goodwill for those operating in this new and challenging space.

Systemic action recommendations in contrast aim to provide sustainable, consistent change at a system level in the medium to long term. These recommendations are focused on dealing with causal challenges and often require multi-generational change. Many of these recommendations involve changes in social and political economy dynamics, institutional and governance reform, professionalisation and increased capacity and capability in the public sector. The scale of the challenge of the possible systemic interventions and actions suggested cannot be underestimated but multi-decade thinking needs to begin somewhere and the global inter-est in a just transition provides such an opportunity to dream big.

The recommendations have been carefully checked to ensure that all suggested ad hoc solutions support, and do not undermine, the pursuit of longer term system level change.

Table 7: Potential Ad Hoc and Systemic Activities to support Just Transition Pipeline Building in South Africa

	POTENTIAL AD HOC ACTIVITIES	POTENTIAL SYSTEM LEVEL ACTIVITIES
QUADRANT A		
Collaborative relational issues with municipal government	• Formalised committees facilitated by a third party to bring the project originator, municipal and national governments together with the goal to unstick specific project impediments.	• Capacity building and skills upgrading in municipalities. • Increased oversight and accountability of municipal delivery and behaviour in relation to just transition projects (publication of plans and community feedback sessions)
Collaborative relational issues with community organisations	• Utilisation of an existing third party to mediate, oversee and support originator/community relationships during a project.	• Research into operational and pragmatic community definitions and structures. • Structures which facilitate better collaborative relationships in support of increased investment and community empowerment.
QUADRANT B		
Implementation, Activation and fine-tuning of existing enabling legislation and regulations	• Expert SWAT Team for well scoped specific issues comprising mandated authorities and technical experts and resources	
Development of Enabling legislation and regulations	• Policy support, capacity building, technical assistance, research assis-tance, mentoring and secondments	
Signalling and Communication		• Deepening and improving alignment between national climate goals, national innovation agenda, industrial policy, and clarity of s hareholders expectations of their SOEs
QUADRANT C		
Information about what counts as a just transition project	• Appropriately mandated pilot process to agree on a starting point definition, guidance and tool for what counts as good enough to be termed just. • Pilot educational and socialisation program design, material development and roll out • Monitoring, evaluation and learning about adoption rates	• Nationally accepted definition and codification of what counts as a just transition project I investment (equivalent of BBBEEE codification) • Alignment between just transition definition, green finance taxonomy and ESG reporting • Increased and improved interoperability of South African approach to just transition investment identification
Information about who to access when in the just transition finance/support ecosystem	• JT financial and support ecosystem literacy education programme design, material development and roll out • Walk-in centres and referral resources using existing institutions and structures	• Addition to Life Orientation School syllabus to include financial literacy and understanding of the financial ecosystem • System wide digital (AI) clearing house and redirection system to improve access to financial and support services
Supporting the development of more credible just transition projects that can be progressed	• Pilot programme research, design, process and roll out to provide for pre-pipeline ideation formalisation and articulation • Walk-in centres using existing institutions and structures. This must include templates, guidance materials and training of personnel to offer such services • Training community practitioners • Community-based capacity building	• New qualification and training syllabus for amended profession in financial ecosystem that supports making deals at scale rather than buying deals • Creating appropriate incentive structures to facilitate system level change in the financial ecosystem • Improvement to country's approach and tools for enterprise development
QUADRANT D		
Accessing resources to generate new information	• Linking and partnership building • Support for access to international conferencing and networking	• Improvements to national innovation system and alignment with transitioning agenda • Increased role of the entrepreneurial state • Increased support to develop the venture capital industry and provide university incentives in the green/SEI/just space

Source: Author.

Conclusion

The conceptual framework developed in this report is an initial step towards supporting a necessary dialogue and call to action to support the building of a more robust pipeline of just transition projects in South Africa. The framework is evidence based and articulates the barriers identified by a wide range of just transition project originators offering a portfolio of just transition projects.

The framework brings a structure and coherence to dealing with the complexities of supporting a pipeline of highly heterogenous projects and vastly different project originators operating in environments that differ in terms of sector newness and enterprise resource access. Finding a way to consistently deal with this complexity is crucial if it is accepted that everyone (all different project originators and players in the financial ecosystem) will have a role to play in transitioning South Africa to a low carbon economy in a manner which is just. The intention of the framework and the research is to assist a wide range of role players (donors, financiers, DFI's, MDB's, Multilateral Development Banks government and developmental support organisations) to understand their organisational mandates, to position their individual project pipeline activities and create their programming, instruments and mechanisms in a broad domestic just transition pipeline barrier context. For South Africa this can facilitate decreased fragmentation, duplication and increase focus on crucial existing gaps and low hanging fruit. At an organisational level the framework can contextualise and improve in-house strategic decision-making and positioning in the overall landscape of the South African pipeline, and contribute to improved alignment and collective programming across organisations operating in the just transition pipeline space. Both of these would positively contribute to increasing the robustness of the just transition pipeline in South Africa.

As with most highly complex issues, the research suggests no one size fits all quick fix. Resolving general investment pipeline robustness in South Africa has been a decades long challenge which remains unresolved (NBI, 2013) . Resolving pipeline issues specific to just transition pipeline projects is an even more challenging ask. While a less fragmented, more aligned and co-ordinated approach to building the pipeline has been emphasised so has the need for increased dialogue and delivery against mandates and agreements. It is crucial for those officially mandated in South Africa to provide leadership in the just transition space, and those responsible to enable economic diversification and green economy growth to take up their roles in a consistent manner that builds trust and confidence across all role players. Ad hoc and system level leadership and action is required immediately if the just transition in South Africa is to be mainstreamed, if the pipeline of projects and investments available to funders and supporters are to become more robust, and most importantly if those on the ground displaced by the transition to a low carbon economy are not left behind.

References

Domil, A. 2022, *Assessment of Economic Impact Generated by Industry 5.0, from a Readiness Index Approach Perspective.* OECD.

G7 Impact Taskforce. 2021, *Mobilising Institutional capital towards the SDG's and the Just Transition, Full Report.* Workstream B.

Hattingh, E. 2022. *Unpacking South Africa's Road to Building Back Better, Fairer and Greener: Access to Inclusive Finance for Local Green Entrepreneurs in South Africa.* Trade & Industrial Policy Strategies.

III. 2023. *Just Transition Criteria : Our Proposition for alignment with the Just Transition*, Draft. Impact Investing Institute.

JETP. 2023. Just Energy Transition Investment Plan. Just Energy Transition Partnership. Pretoria.

Krutham. 2023. *Funding social justice in the energy transition – A role for private sector financing at scale?* Commissioned by the Presidential Climate Commission. Available at: https://www.krutham.com/reports/funding-social-justice-in-the-energy-transition/

Lowitt, S. 2021. *Just Transition Finance Roadmap.* Trade & Industrial Policy Strategies

Lowitt, S. Mokoena, I., Steuart, I., 2023. *Just Transition Tagging Tool (1st Iteration).* Trade & Industry Policy Strategies.

Lowitt, S. 2024. *Just Transition Tagging Tool (2nd Iteration): A Users Guide.* Trade & Industrial Policy Strategies.

Makgetla, N. 2020. *Inequality in South Africa: An introduction.* Trade & Industrial Policy Strategies

Mankins, J. 1995. *Technology readiness levels: A White Paper.* Office of Space Access and Technology, NASA.

Mazzucato, M. 2013. *The Entrepreneurial State: Debunking Public vs. Private Sector Myths*, Anthem Press

Montmasson Clair, G. 2021. *Policy Primers for a Just Transition.* Trade & Industrial Policy Strategies.

Naidoo, C. 2021. *Transition demands and financial intermediaries: The case of energy transitions in South Africa (1994 to 2019).* Thesis Submission. Sussex University.

NBI. 2015. *It's the economy stupid, framing a conversation on the green economy*. National Business Initiative. Authors: Nicholls, S, Vermaak, M and Moolla, Z. NBI Climate Change Programme.

National Development Plan. 2012. *National Development Plan 2030: Our Future make it work.* Pretoria Is 2012 correct Also who is the author - SA Government or National Planning Commission?

Yes - it's the original NDP written by the National Development Planning Commission

PCC. 2022. *Framework for a Just Transition in South Africa.* Presidential Climate Commission. Johannesburg
PCC. 2023. *Just Transition Finance Mechanism Draft Report for Public Comment.* Presidential Climate

Commission. Johannesburg

PCC. 2024. Social report 202.4 Presidential Climate Commission. Johannesburg.

Robins, N., Gouldson, A., Irwin, W., Sudman, A. and Rydge, J. 2019*. Financing Inclusive Action in the UK: An Investors Roadmap for the Just Transition*. Grantham Institute, London School of Economics

Salles, C., Lunardi, F. and Thompson, D. 2022. 'A Framework Proposal to Assess the Maturity of Green IT in Organizations'. *Sustainability* Vol14, Issue 9.

Valodia, I. 2012. 'The Informal Economy in South Africa: Debates, Issues and Policies*.' Journal of Applied Economic Research* Vol 6(2). National Council of Applied Research.