Stresses / Shocks

Power outage | Infrastructure failure | Unemployment

Qualities of a resilient city

Reflective city | Flexible city | Integrated city

Building resilience in the solar PV sector through quality assurance and skills development

Purpose

This case study focuses on local and national quality assurance and skills development initiatives that are contributing to the creation of a resilient and profitable solar PV industry in Cape Town.

It is written for decision makers in government, academia and business in South Africa (SA) and beyond, who are involved in energy security/resilience, strategic economic development, quality assurance, and skills development.

Written from GreenCape's perspective as a player in the initiatives, this case study focuses on the development of:

- The **South African Renewable Energy Technology Centre** (SARETEC), an accredited, national, renewable energy training centre.
- The national South African Qualifications Authority (SAQA) accredited **Solar Photovoltaic (PV) Service Technician qualification.**
- The **PV GreenCard**, a voluntary national initiative by the South African Photovoltaic Industry Association (SAPVIA) which promotes safe and quality solar PV installations and installer accreditation.

It provides information on each initiative and important general lessons for building energy resilience.

KEY INSIGHTS

- ✓ **Municipalities can lead skills development** with national impacts, with the right support and partners.
- ✓ **Learn from mature markets and past experience:** Proactively incorporate lessons, experience and expertise.
- ✓ **Build small, agile and informal partnerships** between a diverse set of local, national and international actors.
- ✓ **Local skills development requires local partners:** Local skills gaps are best addressed by involving local training partners, and a local support system.
- ✓ **Funding needs to be provided from supportive partners** with a strong vision of the future.
- ✓ **Timing is critical:** Skills development and QA measures need to proactively lead market development.

Cape Town aspires to be a resilient city and is working in partnership with 100 Resilient Cities (100RC), pioneered by the Rockefeller Foundation. Cape Town is developing a roadmap to enable the city to become more resilient to growing physical, social and economic challenges. This case study is part of a series highlighting how Cape Town is building resilience.

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Background

When South Africa's Department of Energy released the Integrated Resource Plan (IRP) in 2010, with its allocation for **wind and solar power generation**, the country's renewable energy sector was in its infancy. In spite of this, there was wide recognition at the time that the country needed to transition away from coal-based generation, because of **energy security concerns, emission reduction commitments**, and the **socio-economic benefits of a thriving renewable energy sector**.

An entire ecosystem to support renewable energy value chains and growth needed to be developed. Part of this ecosystem needed to include **quality assurance mechanisms and skills development efforts**.

Much of this needed to happen, concurrently, and in a non-centralised way, through the initiative and actions of key players across government, academia and business, as this case study shows.

These players had **international experience and expertise** to draw on, including **valuable lessons from a national solar water heating rebate programme** that was rolled out in 2008. For skills development and quality assurance, the outcomes of the programme highlighted the **need for standards, training and qualifications based on international best practice**.

In Cape Town and the Western Cape, the opportunities in **small-scale and utility-scale solar PV** were identified early on, together with barriers including a lack of skills, and a **lack of quality assurance and safety mechanisms**. GreenCape, as the then newly-appointed green economy sector development agency in the province, was involved in a number of initiatives driven by government, training institutions, business associations and others.

This case study outlines **three major initiatives** GreenCape supported, telling the story of their development and **highlighting lessons learned** for other cities, provinces and countries. It also highlights the role of the City of Cape Town, and numerous other local players, and showcases how they've contributed to the development of the initiatives.

What is resilience?

Resilience is the 'capacity of individuals, communities, institutions, businesses and systems within a city to survive, adapt and grow no matter what kind of chronic stresses and acute shocks they experience' (100 Resilient Cities, 2019)

1. Establishing a national renewable energy training centre

The South African Renewable Energy Technology Centre (SARETEC) is the first national renewable energy training centre in South Africa. It is hosted at the Cape Peninsula University of Technology (CPUT) in Cape Town. Since opening its doors in July 2015, SARETEC has been delivering **specialized industry-related and accredited training** for the entire renewable energy industry, including short courses and workshops.

Who was involved?

SARETEC's establishment was driven by a consortium comprising of several entities and funders, as shown in the diagram below. It was supported by the Western Cape Provincial Government through funding to GreenCape, one of the co-ordinating entities for SARETEC.

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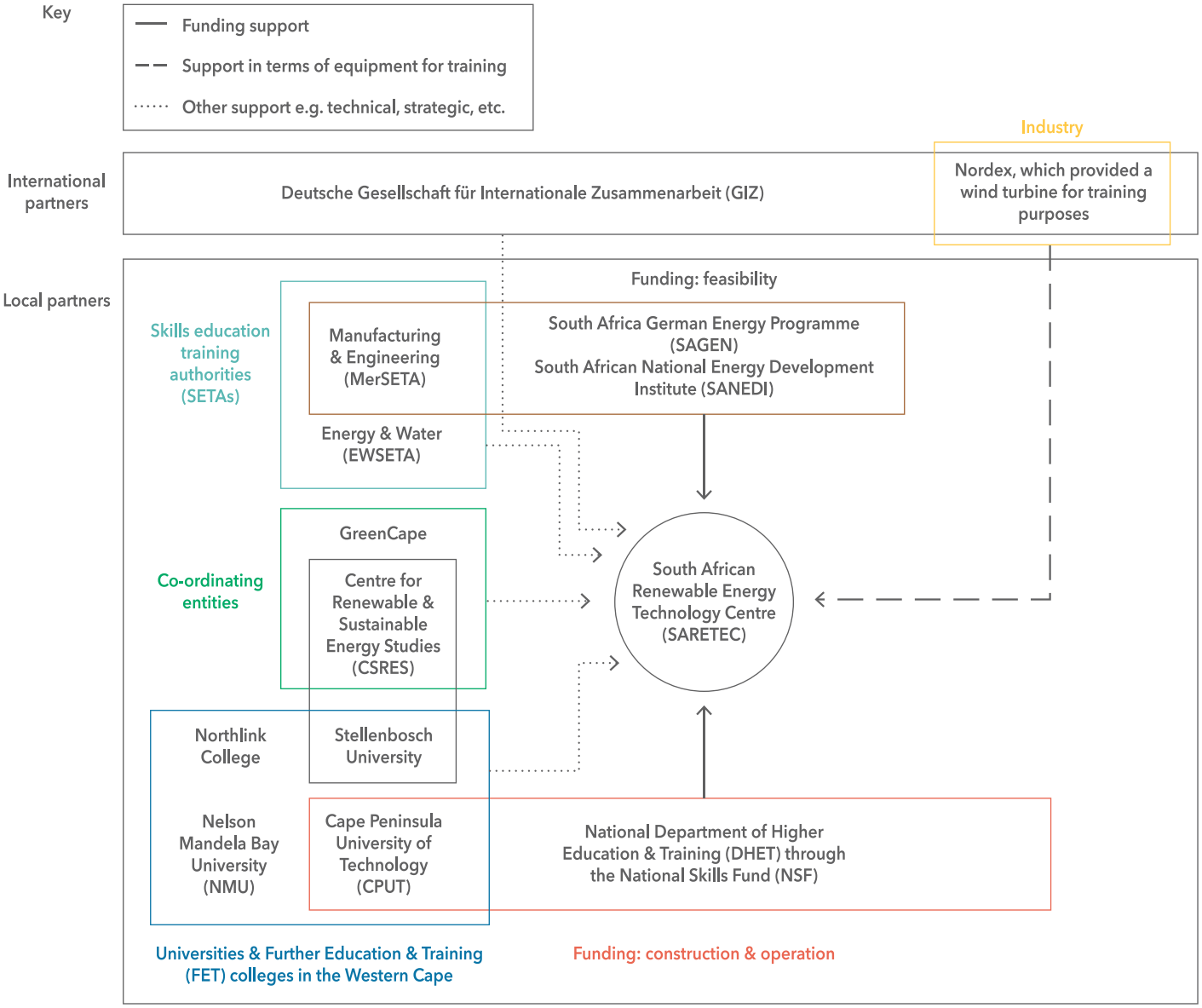

In terms of the timeline, in 2010, the consortium started an initiative to **establish a national** facility for the development of technological and human resource capacities in the wind energy sector – the South African Wind Energy Centre (SAWEC).

It also commissioned a report, funded by the GIZ, which identified a number of potential bottlenecks in wind sector development, drawing on lessons from China and Germany. One of these 'bottlenecks' was the **need for skilled staff** to grow and maintain the future wind sector.

The report highlighted the need to train close to a thousand (each) of engineers, technicians, skills workers and other staff every year in order to ensure a successful wind power sector.
In 2011, the consortium pursued the establishment of a SA Wind Energy Centre (SAWEC), seeking funding from various government agencies and building on the recommendations from the report.

The **functions of the training centre** were also **expanded to include energy efficiency and other renewable energy technology training programmes** (i.e. wind, solar and biomass/biogas qualifications), and thus SARETEC was born.

This was done to ensure a skilled workforce in light of the allocations to renewable energy contained in the Department of Energy's 2010 IRP and the SA Renewable Energy Independent Power Producers Procurement Programme (REI4P).

In 2012, R105 million was secured for the construction of SARETEC from the national Department of Higher Education and Training (DHET) through the National Skills Fund (NSF). SARETEC opened its doors and began training in 2015.

This process is summarised on the following page.

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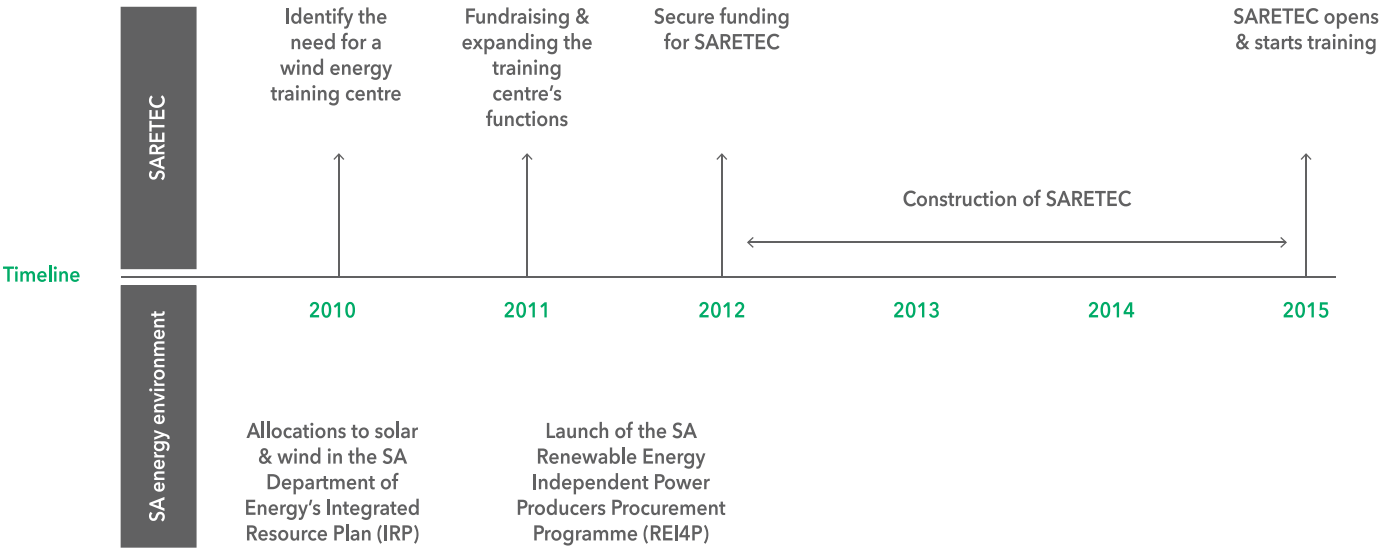

"The idea of SARETEC was first discussed in early 2008 when it was recognized that the development of the renewable energy industry in South Africa must go hand in hand with the establishment of a training system. It was decided to model the training structure according to the proven system of continuing education in Germany."

Dieter Sommer, Senior Advisor, SARETEC, CPUT.
Source: An interview published in Engineering News on the 24 March 2014.

2. Establishing a national accredited solar PV service technician qualification

The **Solar Photovoltaic Service Technician** qualification enables qualified individuals to plan and install a photovoltaic system, and maintain, diagnose and repair electrical and mechanical components of PV systems. The qualification allows technicians to be employed on solar PV farms or at companies that install and maintain solar PV installations.

Two developments supported the need for an accredited qualification:

- **Key role players in South Africa's roll-out of utility-scale solar power under the REI4P** identified the need to ensure quality installations and the availability of a workforce with internationally recognised qualifications.
- The **City of Cape Town**, which committed to retrofit public buildings with small-scale solar water heaters and solar PV systems, identified a need for qualified and accredited installers/ technicians to ensure the quality of residential and public installations.

Who was involved?

This qualification was supported by several partners, as shown in the diagram on the next page.

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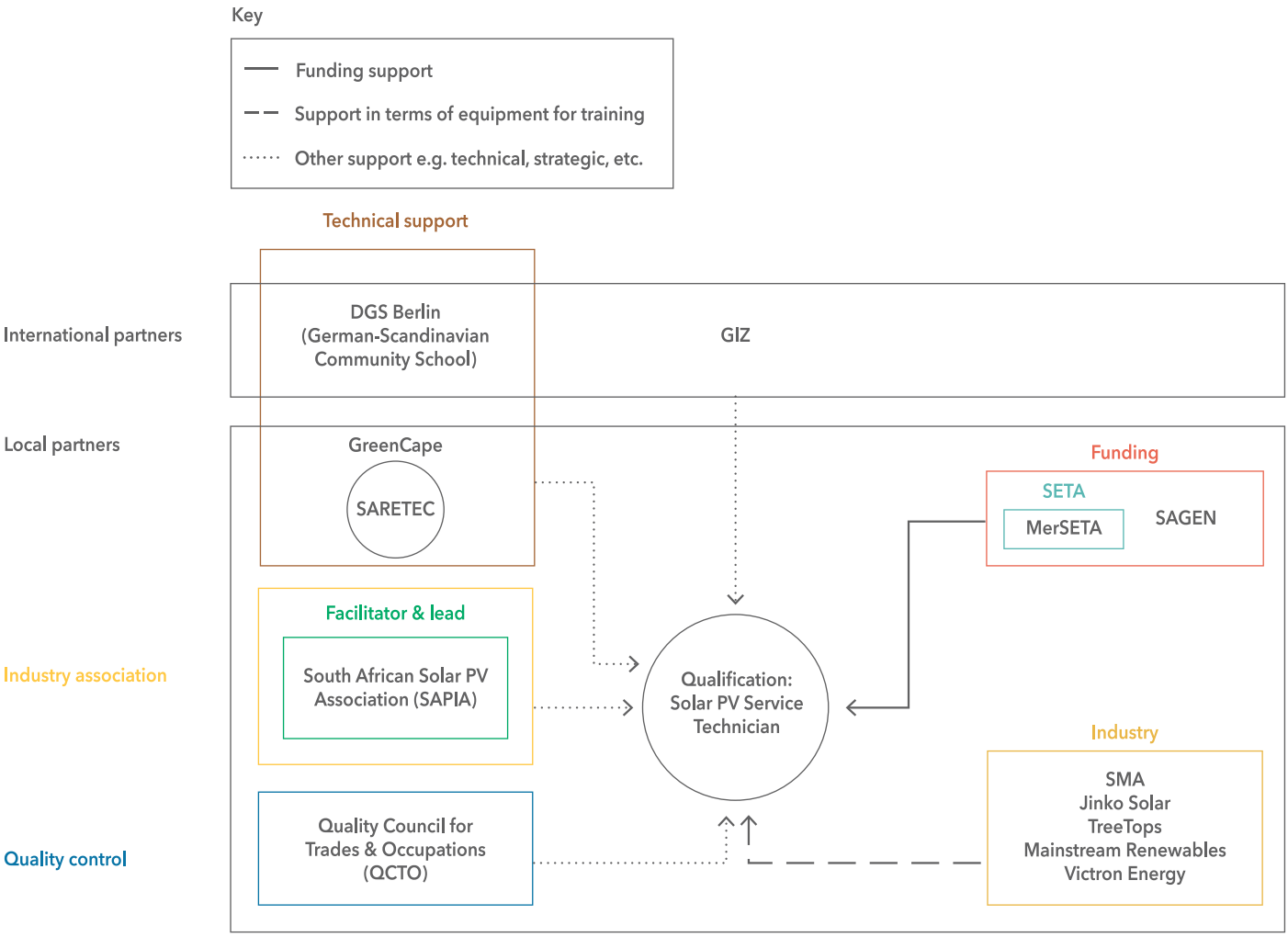

3. Establishing a voluntary quality assurance and safety mechanism

The **PV GreenCard** is a national initiative which promotes safe and quality solar PV installations, ensuring the safe and sustainable growth of the solar PV industry.

Driven by the SA PV Industry Association (SAPVIA), the PV GreenCard Programme focuses on education, skills development, and training, to build installer capacity as well as improve standards development and compliance in line with international best practice.

The PV GreenCard is an as-built report for the solar PV system owner and a checklist for the installer, which qualified installers provide to their clients on the completion of a project.

Who was involved?

The PV GreenCard was established with the support of a consortium of partners, as shown in the diagram on the following page.

What gave rise to the development of the Solar PV GreenCard?

The initial idea emerged from DGS Berlin (part of the German Solar Industry Association). They offered their support to replicate what in Germany is called the 'PV passport'.

The Solar PV GreenCard has a theoretical and practical assessment component. The assessment component was initially developed by SARETEC and GreenCape, because City of Cape Town needed a vetting mechanism to ensure safe small-scale embedded generation (SSEG) connections.

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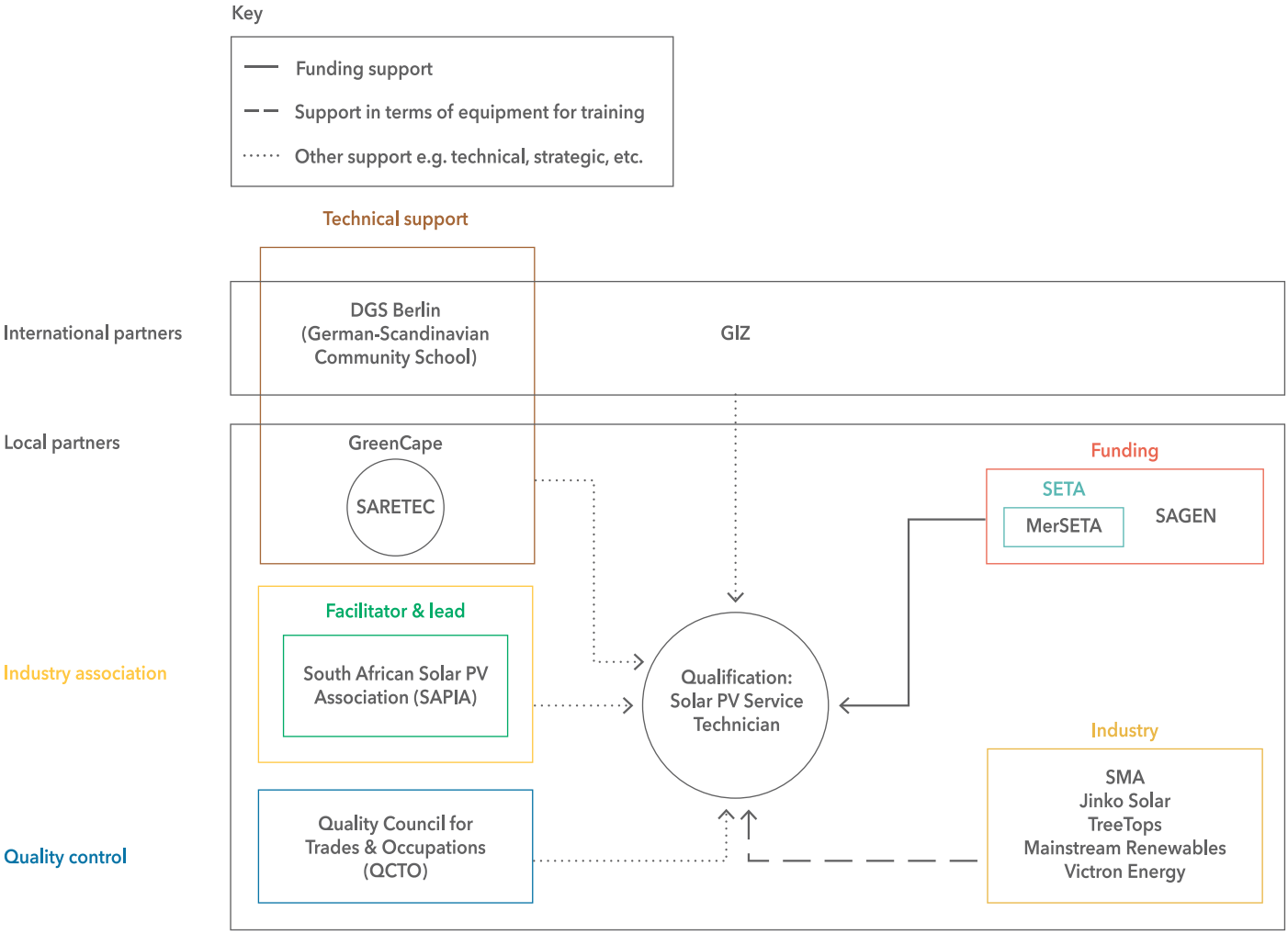

What was done and how?

1. Development of the assessment component

   SARETEC and GreenCape's main contribution was the **assessment component** of the PV GreenCard, which was adopted as the first entry point for the PV GreenCard Programme. The assessment component was initially a measure developed for the City of Cape Town and banks to vet installers and ensure the integrity of the solar PV industry in Cape Town. It was designed to be endorsed by industry associations and has been developed in accordance with the national qualification, relevant national standards and international best practise.

2. Development of the training component

   Having a registered national qualification means that public, as well as private **training providers**, are able to **align their PV training offering to the nationally-accepted and accredited qualification**.

   SAPVIA, supported by the GIZ and DGS Berlin, developed **reference training material** (presentations and supporting documents) for a 5-day Solar PV Installer Course in accordance with the exit outcomes of the curriculum specific to the Solar PV Installer Part Qualification (which is part of the Solar PV Technician training). The course was developed with the aim of presenting the **minimum knowledge requirements for solar PV installers and preparing candidates to undertake the Solar PV Assessment**.

   The reference training material are now provided (free of charge) to training institutions – both public and private – to offer installers a basic training on solar PV installations. Training institutions are welcome to add components to the material provided to enhance the impact of the training.

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Outcomes and impacts

The first PV GreenCard training and assessments were held in April 2017. The programme has expanded to include another training institution in Gauteng. Training and assessments are held on a monthly basis. To date, **53 installation companies** have been registered, and **122 installers** have completed the training and assessment. However only 10 approved PV GreenCard installations have been done to date.

While the City of Cape Town is endorsing the PV GreenCard as a quality assurance mechanism for installers and installation companies, it is not yet a legal requirement. SAPVIA continues to engage stakeholders including the Department of Labour, the National Energy Regulator of South Africa (NERSA), South African Local Government Association (SALGA), Association of Municipal Electricity Utilities (AMEU) and other municipalities to adopt the PV GreenCard.

Lessons for building a resilient solar PV sector

- **Municipalities can lead skills development**, with national impacts, with the right support and partners. The City of Cape Town supported SARETEC and the PV GreenCard initiative. When it identified a skills gap, the municipality joined local partners first, and brought in national partners. This allowed the municipality to have a national impact.
- **Learn from mature markets and past experience:** All three initiatives incorporated lessons, experience and expertise from more mature markets, and past local experience. German funders, industry associations and training centres played a critical role in supporting the initiatives, while the partners drew on lessons from more mature renewable energy markets to identify opportunities and challenges. The lessons from the 2008 roll-out of the Solar Water Heating Programme were incorporated by the key players.
- **Build small, agile and informal partnerships** between a diverse set of local, national and international actors. All three initiatives included skills training authorities, industry associations, local training centres, funders, government agencies, international experts, and sector development agencies. Being small, agile and informal the various consortiums could be flexible, quick to incorporate learnings, adapt fast, and created integrated solutions.
- **A clear vision** was essential in all three initiatives, with consortiums working together to achieve their respective goals.
- **Local skills development requires local partners:** The City of Cape Town example illustrates how effective local skills gaps can be addressed by involving local training partners, and by creating a local support system.
- **Funding from supportive partners** with a strong vision of the future was essential in all three cases. Without the support of funders to undertake the initial work, and without ongoing support to establish the initiatives, these initiatives would not have succeeded. International and local funders (government, industry association members) all played a critical role.
- **Timing is critical:** Skills development and quality assurance measures needed to be put in place in time for the roll-out of small-scale and large-scale solar PV projects.

For more information and support contact GreenCape's skills development desk: info@greencape.co.za or call (021) 811 0250. Additional resources on improving skills development are available from: www.greencape.co.za/content/focusarea/skills-development

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