Cape town energy management

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Cape Town is South Africa"s second largest economic hub, with a population of around 4.2 million in 2018 and a land area of more than 400 square kilometres. Cape Town contributed 9.8% of the national economic output in 2018 and is dominated by the service sector, with significant finance, insurance, real estate and business activities.

Coal contributed 83% of South Africa"s electricity generation capacity in 2016 (latest available data), with nuclear power and natural gas representing 4% and 5% respectively and renewable energy making up the remaining 8%. The government aims to increase the renewable share in the generation mix to around 40% by 2030 through various policy instruments, as promulgated in the Integrated Resource Plan (IRP)i of 2019.

The City of Cape Town has taken an active leadership role in renewable energy deployment, emphasising not just technology change but also the need to improve governance and institutions and to engage key players in the energy transition, from national government to business and civil society. The decoupling of electricity demand from economic growth in the Metropolitan Municipality over the last decade is attributed to energy efficiency and renewable energy interventions in the face of soaring electricity prices and insecure electricity supply in South Africa.

The transport sector, which relies almost exclusively on petrol and diesel, accounts for 62% of Cape Town"s total final energy demand and contributes a third (32%) of the Metro area"s greenhouse gas emissions. The sector"s high energy use is largely a result of the city"s sprawling and segregated form, which reflects the legacy of apartheid"s spatial planning. The commercial sector is the second most energy-intensive sector (14% of total final energy demand) followed by households (12%) and industry (12%).

Electricity is the main energy carrier in Cape Town"s non-transport sectors, and because most of the electricity in South Africa comes from high-carbon coal-fired power plants, the built environment accounted for 55% of the city"s greenhouse gas emissions in 2018. Residential electricity use in Cape Town is split largely across cooking, lighting and space heating applications, while in the commercial sector electricity use is dominated by lighting, heating and ventilation in office buildings.

The city benefited from learning by doing. Catalysed by the Energy Efficiency and Demand Side Management Programme, launched by South Africa"s Department of Mineral Resources and Energy, Cape Town began an

extensive and ambitious drive in 2008 to improve the energy efficiency of municipal operations, saving a cumulative ZAR 225 million (USD 16 million) through 2019. The City began supporting small-scale "embedded generation" in 2011, making it South Africa"s first city to develop tariffs and rules for distributed renewables and serving as a blueprint for the rest of the country.

Building on earlier roll-outs of solar water heaters in low-income communities, in 2013 Cape Town implemented a programme to promote this technology more widely, helping to reduce energy from one of the highest electricity-consuming end-uses for city households, water heating. By 2015, some 46,000 solar water heaters had been installed city-wide, saving 128,000 MWh per year, creating employment equivalent to 1,300 job-yearsiii, contributing more than ZAR 380 million (USD 27 million) to the local economy and reducing more than 132,000 tonnes of carbon emissions per year.

Cape Town is also honouring its international commitments to climate action. It is a signatory to various initiatives including the Mexico City Pact, CDP, the carbonn Climate Registry, the Covenant of Mayors in Sub-Saharan Africa and the C40 Cities Leadership Programme. The City also has committed to achieving carbon neutrality by 2050, recognising that this will require ambitious actions across all sectors. To translate these commitments into action, Cape Town has woven them into its Integrated Development Plan for the period 2017-2022.

The City"s transport plan includes exploring the potential production and use of biofuels in transport, using renewables for infrastructural facilities such as depots and transport interchanges, and replacing the municipal diesel bus fleet with electric buses (which eventually would be powered with renewables). In a pilot project in early 2018, the City"s "MyCITI" bus rapid transport service added 11 locally manufactured electric buses to its fleet.

Cape Town is working to prepare its power grid for high EV penetration in the near future. The Electric Vehicle Framework includes leveraging EV roll-out and charging to increase the share of renewables in final energy consumption, and is considering requiring public EV charging stations that exceed a specific demand threshold to operate on renewable energy. This energy is expected to be either generated from local solar PV capacity or purchased through a contractual arrangement.