

IN THE HIGH COURT OF SOUTH AFRICA
GAUTENG DIVISION, PRETORIA

Case No:

In the matter between:

AFRICAN CLIMATE ALLIANCE	First Applicant
VUKANI ENVIRONMENTAL JUSTICE MOVEMENT IN ACTION	Second Applicant
THE TRUSTEES FOR THE TIME BEING OF GROUNDWORK TRUST	Third Applicant
and	
THE MINISTER OF MINERAL RESOURCES AND ENERGY	First Respondent
THE NATIONAL ENERGY REGULATOR OF SOUTH AFRICA	Second Respondent
THE MINISTER OF FORESTRY, FISHERIES AND THE ENVIRONMENT	Third Respondent
THE PRESIDENT OF THE REPUBLIC OF SOUTH AFRICA	Fourth Respondent

EXPERT AFFIDAVIT

I, the undersigned,

JESSE ALEXANDRA SARAH BURTON

do hereby make oath and say that:

- I am an adult female consultant at the University of Cape Town ("UCT"), and working as an energy researcher in the Energy Systems Research Group in the Department of Chemical Engineering at the University of Cape Town, previously known as the Energy Research Centre.

B
AJ

2. The facts set out in this affidavit fall within my personal knowledge and belief, except where the context indicates otherwise, and are true and correct.
3. I am the co-author of an August 2021 report entitled '*Assessment of New Coal Generation Capacity Targets in South Africa's 2019 Integrated Resource Plan for Electricity*'. This report provides an assessment of the impacts of the inclusion of 1 500 MW of new coal-fired power capacity as proposed in the IRP 2019, using the South African TIMES model ("SATIM"). A copy is attached as "FA5".
4. My qualifications are set out in my curriculum vitae attached marked "JB1". In brief my qualifications and expertise are as follows:
 - 4.1 I hold a Masters degree in Energy Studies from UCT. I have been producing work for the ERC (now the Energy Systems Research Group ("ESRG")) for approximately 7 (seven) years.
 - 4.2 Prior to that, from 2012 to 2016, I worked as course coordinator of the 'Introduction to Energy Policy and Sustainable Energy Engineering' course at the ERC.
5. Given my qualifications and experience, I am duly qualified to express an expert opinion on the matters addressed in the attached report.
6. Where we have based our opinions on journal articles, book chapters, reports, studies and other documents referenced in this expert report, I confirm the reliability of these materials based on my own experience and training and further confirm that they are written by persons of established repute, proven experience in the field, or evident knowledge of the matters they address.

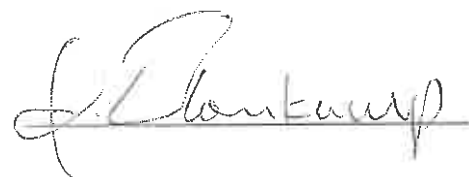
Handwritten signature and initials in the bottom right corner of the page.

7. I confirm the content of the aforementioned report, and confirm that the methodology relied upon in the report is robust and credible. The report relies on internationally-recognised modelling methodologies and platforms.
8. I further confirm that we reviewed the fair share methodology developed in the report commissioned by the Climate Equity Reference Project dated 21 July 2021, titled "New Coal Power Generation in South Africa in Light of South Africa's Climate Fair Share", and applied the recommendations made by the Presidential Climate Commission as well as the updated Nationally Determined Contribution for South Africa (September 2021) to evaluate what building 1500 MW of new coal power generating capacity, in the context of greenhouse gas emission reductions, would mean for system costs.



JESSE ALEXANDRA SARAH BURTON

Thus signed and sworn to before me at Cape Town on this 4th day of November 2021 by the deponent who has acknowledged that she knows and understands the contents of this affidavit, that she has no objection to taking the prescribed oath and that the prescribed oath is binding on his conscience.



COMMISSIONER OF OATHS

NAME: Jane Sarah
 CAPACITY: Blonkump
 ADDRESS: practising
advocate
56 Keerom Street
Cape Town

Jesse Alexandra Sarah Burton

Senior Associate, E3G, London, United Kingdom
Researcher, Energy Systems Research group, University of Cape Town, Rondebosch, 7700, South Africa
 Cell: +27 (0) 84 5599 229,
 E-mail: burton.jesse@gmail.com
 Twitter: [Jesse_Burton](#) ; website: jesseburton.com

Bio

Jesse Burton is a researcher in the Energy Systems Research group at the University of Cape Town and a senior associate at global thinktank E3G, where she provides analysis and policy advice on coal transitions globally.

She is a specialist in coal and electricity markets and energy and climate change policy in South Africa. Her research focuses on the challenges and opportunities of the energy transition for coal dependent countries, including just transition strategies.

Her research has quantified and examined the politics of fossil fuel subsidies in South Africa, the cost and greenhouse gas implications of future coal investments, the costs and risks of stranded assets in the South African energy sector, and the economics of coal-fired power and coal mining. She led the South African team of the global Coal Transitions research project, which examined the implications of fossil fuel economics and climate policy on large coal countries, including labour market effects. Recent projects have included the development of an electricity plan for South Africa in the context of global climate policy goals, analysis of the employment and skills impacts of future electricity pathways, strategies for implementing a just transition for coal workers and communities in South Africa, and the development of Just Transition strategic plans for the South African government.

Jesse is a member of the Just Transition taskforce of the Powering Past Coal Alliance, sits on the Advisory Board for the National Business Initiative Just Transition Pathways Project, is a member of the Mpumalanga Green Economy Cluster steering committee, and is an industry working group member for the South African Renewable Energy Masterplan. She has lectured widely at postgraduate level on energy and climate change topics, including convening the 'Introduction to Energy Policy and Sustainable Energy Engineering' course and coordinating the postgraduate programme at the (former) Energy Research Centre at UCT.

Jesse holds a BA (Hons) in History from Rhodes University and MSc in Energy Studies from the University of Cape Town.

June 2019 – present Senior Associate, E3G London

Provision of technical support and policy advice for diplomatic interventions and government-to-government engagement on fossil fuel transitions, specifically coal phase down. Research and analysis on coal transition and electricity markets, techno-economic and political briefings on global coal markets and coal using countries, support for diplomatic teams on coal. Her research includes the production and synthesis of research and analysis on multiple coal using countries, including South Africa, Indonesia, Pakistan, Kenya, India, Bangladesh, and Russia.

2014 – present Researcher, Energy systems research group (formerly Energy Research Centre), University of Cape Town

Researcher in the Energy Systems Research group. Jesse is a specialist in coal and electricity markets and energy and climate change policy in South Africa and globally. She works to integrate quantitative economic and energy

B

JSB

systems analysis into policy advice on the challenges and opportunities of the energy transition for coal dependent countries, including just transition strategies.

Research outputs

Book chapters and journal articles

- Burton, J., Baker, L., Marquard, A., Lehmann-Grube, P. (forthcoming). From MEC to Net-Zero: the role of the energy sector in the Just Transition. In Xaba, N & Fakir, S (eds). *Low Carbon Futures for South Africa*. Mapungubwe Institute for Strategic Reflection.
- Hanto, J., Krawielicki, J., Schroth, A., Oei, P. and Burton, J. (in press). The Political Economy of Energy and Climate Policy in South Africa. In: *The Political Economy of Coal: Obstacles to Clean Energy Transitions*. Routledge.
- Marais, L., Burton, J., Campbell, M. and Nel, E., (2022). Mine closure in the coal industry: global and national perspectives. In Marais, L., Burger, P., Campbell, M., Denoon-Stevens, S., Van Rooyen, D. (Eds), *Coal and energy in Emalaheni, South Africa. Considering a just transition*. Edinburgh University Press: Edinburgh. (forthcoming).
- Baker, L, Burton, J., & Trollip, H. (2020) 'The Energy Politics of South Africa' in Hancock, K. & Allison, J (eds) *The Oxford Handbook of Energy Politics*. Oxford: Oxford University Press. DOI: 10.1093/oxfordhb/9780190861360.013.25.
- Burton, J, Lott, T, Rennkamp, B. (2018) 'Sustaining Carbon Lock-in: Fossil Fuel Subsidies in South Africa'. In van Asselt, H & Skovgaard, J. *The politics of fossil fuel subsidies and their reform*. Cambridge: Cambridge University Press
- Baker, L and Burton, J (2018) 'The politics of procurement and the low carbon transition in South Africa' in A. Goldthau, M. Keating and C. Kuzemko (eds.) *Handbook of the International Political Economy of Energy and Natural Resources*. Edward Elgar.
- Spencer, T, Colombier, M, Sartor, O, Garg, A, Tiwari, V, Burton, J Caetano, T, Green, F, Teng, F & Wiseman, J (2017): The 1.5°C target and coal sector transition: at the limits of societal feasibility, *Climate Policy*, DOI: 10.1080/14693062.2017.1386540. <https://doi.org/10.1080/14693062.2017.1386540>

Selected research reports and working papers

- Merven, B, Burton, J, Lehman-Grube, P (2021). Assessment of new coal generation capacity targets in South Africa's 2019 Integrated Resource Plan for Electricity. Energy Systems Research Group, University of Cape Town, South Africa.
- Marquard, A., Hartley, F., Merven, B., Burton, J., Hughes, A., et al (2021). Technical Analysis to support the update of South Africa's First NDC mitigation target ranges. University of Cape Town. Report. <https://doi.org/10.25375/uct.16691950>
- Ahjum, F, Godinho, C, Burton, J, McCall, B & Marquard, A. (2020). A low-carbon transport future for South Africa: technical, economic and policy considerations. Energy Systems Research Group, University of Cape Town, South Africa.
- Merven, B., Hartley, F., McCall, B., Burton, J., and Schers, J. (2019) Improved representation of coal supply for the power sector for South Africa SA-TIED Working Paper #84, October 2019. IFPRI, Washington DC. https://satied.wider.unu.edu/sites/default/files/pdf/SATIED_WP84_Merven_Hartley_McCall_Burton_Schers_October_2019.pdf
- Burton, J, Marquard, A, McCall, B. (2019). Socio-economic considerations for a Paris Agreement-compatible coal transition in South Africa. June 2019, Energy Research Centre, University of Cape Town, South Africa.
- Strambo, C., Burton, J., Atteridge, A. (2019). The end of coal? Planning a "just transition" in South Africa. Stockholm Environment Institute and Energy Research Centre. Workshop brief, available at <https://www.sei.org/publications/the-end-of-coal-planning-a-just-transition-in-south-africa/>.

ASC 3

- McCall, B., Burton, J., Marquard, A., Hartley, F., Ahjum, F., Ireland, G., & Merven, B (2019). Least-cost integrated resource planning and cost-optimal climate change mitigation policy: Alternatives for the South African electricity system. Energy Research Centre, University of Cape Town
- Hohne, N., et al (2019). Chapter 4: Bridging the Gap – Enhancing mitigation ambition and action at G20 level and globally. In UNEP (2019) *The Emissions Gap Report 2019*.
- Burton, J, Caetano, T, McCall, B (2018) South Africa's coal transition: understanding the implications of a 2°C-compatible coal phase out plan for South Africa. Energy Research Centre, University of Cape Town
- Hartley, F, Burton, J, Cunliffe, G, Caetano, T, Ntuli, N, Fourie, R, Chiloane, L. (2018). Co-benefits assessment of the future development of employment in the power sector and skills needed in South Africa. Energy Research Centre, University of Cape Town
- Ireland, G & Burton, J (2018). An assessment of new coal plants in South Africa's electricity future: The cost, emissions, and supply security implications of the coal IPP programme. Energy Research Centre, University of Cape Town
- Steyn, G, Burton, J, Steenkamp, M (2017). Eskom's financial crisis and the viability of coal-fired power in South Africa: Implications for Kusile and the older coal-fired power stations. *Meridian Economics*, Cape Town: South Africa.
- Amit Garg, Jan Christoph Steckel, Jesse Burton, Julio Friedmann, Frank Jotzo, Gunnar Luderer, Pao-Yu Oei, Michiel Schaeffer, Samantha Smith, Fabby Tumiwa, Adrien Vogt-Schlib, Paola Yanguas-Parra, Xianli Zhu (2017). Chapter 5: Bridging the gap – Phasing out coal. In UNEP (2017) *The Emissions Gap Report 2017*.
- Burton, J, Caetano, T, Hughes, A, Merven, B, Ahjum, F, McCall, B. (2016). "The impact of stranding power sector assets in South Africa: Using a linked model to understand economy-wide implications." Energy Research Centre, University of Cape Town, Cape Town
- Baker, L., Burton, J., Godinho, C., Trollip, H. (2015) "The political economy of decarbonisation: exploring the dynamics of South Africa's electricity sector". Energy Research Centre, University of Cape Town: Cape Town
- Burton, J & Winkler, H (2014). "South Africa's planned coal infrastructure expansion: drivers, dynamics and impacts on greenhouse gas emissions" Energy Research Centre, University of Cape Town, Cape Town, South Africa.

Current research projects

Mpumalanga Just Transition Strategy: Development strategic plan for a Just Transition for the Mpumalanga Provincial Government (funded by ICLEI Africa)

With University of Cape Town:

Transnational Centre on Just Transitions (TRAJECTS): A 5-year, DAAD-funded project to develop South-South and North-South cooperation and teaching on just transition and fossil fuel phase out between South Africa, Colombia, and Germany. The project develops local as well as transnational answers and perspectives towards just transitions to protect our shared climate and environment and achieve a sustainable future through transdisciplinary teaching and learning, research capacity development and international exchange and cooperation

Climate Transparency: Climate Transparency is a global partnership with a shared mission to stimulate a 'race to the top' in G20 climate action and to shift investments towards zero carbon technologies through enhanced transparency. It also includes a South African-specific analysis that examines the socio-economic impacts of and governance structures for an accelerated coal phase-out in South Africa.

Past research projects

Coal Transitions: Research and Dialogue on the future of coal. The project is developing credible and feasible trajectories and policy packages for deep transitions in the coal sector in six major coal using countries. The South African analysis comprises the development of a detailed coal mine database and energy systems and macro-economic modeling to understand the implications of meeting 2°C for the South African coal sector,

ASL

- coupled with the development of transition pathways for workers out of the coal sector (with IDDRI, Climate Strategies and 5 other country teams: <http://www.iddri.org/Projets/Coal-Transitions-Research-and-Dialogue-on-the-Future-of-Coal>)

Supply side fossil fuel policy and the political economy of coal in South Africa: The project examines the political feasibility of supply side climate change policy in South Africa, through analysis of the shifts in the nature of capital/ownership in the coal sector, finance and subsidies for coal mining, and just transition visions and transition policies for South Africa (with the Stockholm Environment Institute, funded by the Swedish Research Council)

Co-benefits of climate change mitigation policy: the study examines the net employment effects of various electricity build plans in South Africa, and explores options for developing pathways for fossil fuel workers into new sectors (with the Centre for Scientific and Industrial Research).

Alternative Integrated Resource Plan for South Africa: The study provides a technical analysis of the scenarios proposed in the draft IRP 2018 by using a similar modelling methodology, to better understand the IRP's key drivers, to test claims concerning least-cost options for the South African electricity sector in the IRP, and to provide additional insight into what would be required for a more ambitious decarbonization pathway for the sector in light of the Paris Agreement.

Professional activities

Advisory Board member of the Mpumalanga Green Economy Cluster

Advisory Board member for the National Business Initiative Just Transition Pathways Project

Member of the *Just Transition taskforce* of the Powering Past Coal Alliance:

<https://poweringpastcoal.org/about/just-transition-taskforce>

Expert witness for the Centre for Environmental Rights, including litigation on coal-fired power plants, amicus for City of Cape Town case

Member the ASSAF Forum on Just Transition

Previously: Member of the *Postgraduate Planning and Administration Committee* in EBE

Education

2009-2011

MSc: Energy Studies

University of Cape Town, Energy Research Centre

Courses: Introduction to energy policy and sustainable energy engineering (73%)

Energy, poverty and development (67%)

Energy, markets and governance (76%)

Energy and climate change (78%)

Thesis topic: "The role of industrial policy in meeting climate change mitigation objectives in South Africa". The thesis examined the relationship between industrial policy incentives, the structure of the South African economy and climate change mitigation in the country, using the minerals-energy complex as a framework.

2007

Bachelor of Arts (Honours)

Rhodes University, Grahamstown

History (with Distinction)

Thesis topic: "Weathering the change: the politics of climate change"

2004-2006

Bachelor of Arts

Rhodes University, Grahamstown

History (with Distinction), Classical Civilisations (with Distinction), Journalism and Media Studies.

OS

750

Relevant conferences & presentations

September, 2019	CoalTrans Southern Africa, Johannesburg, South Africa, "Coal and Sustainability"
November, 2018.	Workshop on mining and society in Emalahleni, University of the Free State, South Africa "The future of coal in South Africa"
September, 2018	Supply-side Fossil Fuels and Climate Policy, Oxford, United Kingdom: "The politics of fossil fuel subsidies in South Africa"
April, 2018	Symposia on the future of coal, Melbourne and Canberra, Australia: South Africa's coal transition
December, 2017	Fossil fuel subsidies workshop, Buenos Aires, Argentina: South Africa's coal subsidies
November 2017	Coal and the 2 Degree target, Dhanbad, India: South Africa's coal transition
June 2017	Trade and Industrial Policy Strategies Forum: mining and sustainable development 'A just transition for South Africa's coal economy'
October 2016	Reframing the minerals-energy complex: understanding the dynamics of the coal sector
September 2016	Supply-side Fossil Fuels and Climate Policy, Oxford, United Kingdom 'The emission implications of South Africa's elite transition'
June 2016	The politics of fossil fuel subsidies and their reform, Stockholm, Sweden 'Sustaining carbon lock-in: the political economy of fossil fuel subsidies in South Africa' (with Lott, T & Rennkamp, B)
September 2015	1 st Global Conference on Stranded Assets, Oxford, United Kingdom 'Stranded assets in South Africa' (with Caetano, T)
July 2015	Our Common Future under Climate Change, Paris, France. 'South African coal infrastructure: drivers and emissions implications'
April 2012	Planet under pressure, London, United Kingdom. Poster presentation (with Coetzee, K). 'Rhetoric versus reality: climate and energy policy in South Africa'

Teaching*Jan 2012-2016*

Course convener of the 'Introduction to energy policy and sustainable energy engineering' course at the Energy Research Centre at the University of Cape Town.

Responsibilities include teaching, curriculum development and course design, student assessment and academic oversight of the Masters-level course, including lecturing on global energy systems and technologies, coal markets, power sector reform, and energy policy. Responsible for approximately 10-15 Masters students per year with multi-disciplinary backgrounds.

Other lecturing experience in the energy and climate change course (fossil fuel infrastructure and climate change) and energy markets and governance (electricity markets). I co-taught the markets & governance course and have guest lectured in the ETH/UCT Summer School on Energy and Development, Social Infrastructures (EBE Faculty), African Climate and Development Initiative (climate change mitigation), and at Stellenbosch University's Renewable Energy Policy module. I have acted as an external examiner for Stellenbosch University at the Masters level (coursework and thesis) and as internal examiner at UCT at Masters level.

June 2013-July 2016

Postgraduate Programme Coordinator, Energy Research Centre at the University of Cape Town

Overall co-ordination of the postgraduate programme at the ERC: academic co-ordination and oversight, curriculum development, external examiner and lecturer for other courses at UCT, co-convener of the Energy for Sustainable Urban Development course hosted by the ERC and Sustainable Energy Africa.

Jan 2010-May 2013

Masters programme tutor, Energy Research Centre, University of Cape Town

Postgraduate supervision

B
ASC

Co-supervisor MPhil Energy and Development Studies, Tawney Lott: "Political economy of liquid fuel subsidies and incentives in South Africa" (2016- 2017)

Co-supervisor MBA thesis, Marisane Thobejane: "Coal Supply security for Eskom" (2016)

Courses attended

- June 2012 United Kingdom Energy Research Centre (UKERC) PhD Summer School
- Sept 2012 African Programme on Rethinking Development Economics (APORDE): Department of Trade and Industry, Industrial Development Corporation and French Development Agency funded programme to train African heterodox economists.
- Oct 2012. Managing Infrastructure Reform and Regulation in Africa: UCT Graduate School of Business. The course covers power sector reform experiences, economic regulation (theory and application), tariff design, pro-poor regulation and standards.

External briefing papers and civil society contributions

Contributor to the 2021 Civil Society Equity Review (forthcoming) and Production Gap Report (2021)

Burton, J, Rennkamp, B. & Trollip, H (2014) "A case study of the implementation of South Africa's carbon tax policy using the GHG Protocol Policy and Action Standard". Energy Research Centre, University of Cape Town, Cape Town, South Africa.

Burton, J, Rennkamp, B. & Trollip, H (2014) "A case study of the Renewable Energy Independent Power Producers Procurement Programme using the GHG Protocol Policy and Action Standard". Energy Research Centre, University of Cape Town, Cape Town, South Africa.

Burton, J. (2011) "A carbon budget for South Africa". Background paper produced for the One Million Climate Jobs Campaign.

Burton, J. (2011) "Renewable energy and job creation in South Africa". Background paper produced for the One Million Climate Jobs Campaign

"South Africa's Mitigation Targets" Briefing paper no 22, produced for Earthlife Africa's Sustainable Energy and Climate Change Partnership.

Media

Interviewed by: New York Times, the Economist, Wall Street Journal, Business Day, Daily Maverick, Mail & Guardian, Politico, News24, Financial Mail. Podcasts with CSIS, Energy Transition Show, the Economist. Radio: the Bruce Whitfield Show, AM Live with Stephen Grootes. TV: Newzroom Afrika, eNCA.

Academic achievements

- 2013 Awarded a National Research Foundation Doctoral Scholarship
- 2011 and 2012 Awarded the Energy Research Centre Doctoral Scholarship
- 2010 Awarded the Dutkiewicz Scholarship for Energy Research
- 2007 Awarded an Honours Degree Scholarship by Rhodes University
Received Academic Colours, Rhodes University
Placed on Dean of Humanities' Merit List, Rhodes University

B

ASC3