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South African National Energy
Development Institute.

Job title	Energy Modeller
Department	CESAR
Main purpose of role	An Energy Modeller constructs engineering and economic models to represent the performance of a system, in order to evaluate and quantify the impact of policy, design, retrofit and operational decisions.
Grade	
Organisational structure	<pre>graph TD; A[CESAR Programme Manager] --- B[Project Manager]; B --- C[Project coordinator]; B --- D[Energy Modeller]; B --- E[Database administrator];</pre>



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Required minimum education/training	<p>Bachelor's degree in Science/Engineering (with preference to Master's/PhD in Energy Studies)</p> <ul style="list-style-type: none">• Quantitative skills – experience of quantitative analysis and use of computer models, preferably in an energy context• Good presentation skills – ability to present technical work to colleagues and to external audiences• Economic and policy skills – ability to understand and critique economic analyses, business strategies or public policies (preferably with an energy sector focus/interest)• Graduate in relevant quantitative subject, e.g. science, engineering or economics, preferably with a further degree• High quality writing and analytical skills – ability to distil key messages from complex source data/reports• Strong inter-personal skills, articulate and able to work with a diverse team of colleagues with backgrounds across science, engineering, business, economics and policy.• Exposure to and understanding of a range of energy policy issues (desirable)
Required minimum work experience	<p>4 years modelling experience with:</p> <ul style="list-style-type: none">• GIS• Times• Osemosys• Plexus• Leap



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Key performance areas

- Defining project Objectives
- Gathering Data
- Specifying Baselines
- Designing alternatives/scenarios
- Constructing models
- Evaluating Results
- Communicating Results

Description of Tasks

No.	Key performance areas What	Input (methods used) How	Output (expected results) Why	Technical and behavioural competencies required
1	Defining project Objectives	<ul style="list-style-type: none"> • Conduct Integrative Design • Review Project Requirements • Develop Internal Project Plan • Research Codes, Standards, and Protocols • Set Target Goals • Set Baselines Select Analysis Method 	<ul style="list-style-type: none"> • Project Charter 	<p><u>Technical:</u></p> <ul style="list-style-type: none"> • Knowledge of South Africa's energy system



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2	Gathering Data	<ul style="list-style-type: none"> • Define Modelling Data Requirements • Compile Resources • Resolve Data Gaps • Collect On-site Data • Assess Existing Conditions 	<ul style="list-style-type: none"> • Data report 	<ul style="list-style-type: none"> • Experience with simulation and/or optimisation energy modelling platforms such as Markel-Times or LEAP
3	Specifying Baseline	<ul style="list-style-type: none"> • Recognize Baseline Methodology • Specify Baseline • Envelope System Specify Baseline 	<ul style="list-style-type: none"> • Baseline study Report 	<ul style="list-style-type: none"> • Programming skills • Proficient in Microsoft Office • High Quality writing and Analytic skills
4	Designing alternatives/scenarios	<ul style="list-style-type: none"> • Brainstorm Improvement Measures • Package Measures into Project Alternatives • Identify Supplemental Modelling Requirements • Collect Incremental Costs 	<ul style="list-style-type: none"> • Project design report 	<ul style="list-style-type: none"> • Common sense • Communication skills • Computer skills



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5	Constructing models	<ul style="list-style-type: none"> • Divide Project into Blocks • Specify Simulation Parameters • Specify Conditions • Construct Model • Specify Generation Systems • Specify Performance Curves • Create Models that Reflect Project Alternatives and Baselines 	<ul style="list-style-type: none"> • Project modelling report 	<ul style="list-style-type: none"> • Engineering skills • Facilitation skills • Math skills • Organizational skills • Patience • Presentation skills
6	Evaluating Results	<ul style="list-style-type: none"> • Run Simulations • Perform Quality Control • Calibrate Model Against Measured Data • Compare Project Alternatives • Perform Economic Analysis • Develop Recommendations 	<ul style="list-style-type: none"> • Final results report 	<ul style="list-style-type: none"> • Project management skills <p><u>Behavioural:</u></p> <ul style="list-style-type: none"> • Ability to work in team environment



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7	Communicating Results	<ul style="list-style-type: none"> • Create Report • Guide Decision Making of Stakeholder • Complete Compliance Documentation • Maintain Energy Knowledge Base 	<ul style="list-style-type: none"> • Workshops 	<ul style="list-style-type: none"> • Good communications skills • Ability to learn quickly • Willingness to travel locally and abroad
8		<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	

The list of tasks/duties and responsibilities contained in this document is not necessarily exhaustive, and the employer is entitled to instruct the employee to carry out additional duties or responsibilities, which may fall reasonably within the ambit of the role profile, or in accordance with operational requirements.



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Role description	Signatures
Agreed by incumbent:	
Agreed by Executive/Manager:	
Date:	