Welcome

Secure and Integrated Energy and Mining Systems Forum
To deliver affordable, reliable and secure energy supplies in a transitioning national energy market, and responsibly unlock the value and opportunities offered by South Australia’s mineral and energy resources.
South Australia
Minerals – transforming our future

community engagement
safe work practices
environmental responsibility

Minerals take us where we want to go
Minerals keep us connected
Minerals power our communities
Contribution of Mining and Energy Industries to South Australia

Current contribution to SA economy $ billion

- Minerals, Oil and Gas 3.7
- Manufacturing of resources .9
- Mining equipment, technology and services .98
- Energy industries 1.8
- Total Energy and Mining 7.6

- South Australia’s economy grew by 2 per cent in 2017/18
  - Mining was 50.6 per cent of SA goods exports
  - Energy (electricity) is growing strongly (8.2 percent)

- The 2019 Joyce Report to SA Government
  - challenges SA to achieve a 3 per cent sustainable growth rate
  - and identifies a big future for energy and mining
  - provided some constraints are removed
South Australia’s Mines and Projects
2017 - 2018 MINERAL AND PETROLEUM INDICATORS

**$158m**
spent on exploration for new deposits

**$1,596m**
capital expenditure investment in new mines and petroleum

**$5,643m**
production value driving economic development

**$237m**
dollars worth of royalties for future state growth

**$3,993m**
worth of commodities exported to global trading partners

**12,000 people**
employed locally and in regional South Australia

**sources:** ADS Cat 8412.0, company reports, 6291 & DEM
South Australia
Mineral Industry Project Pipeline

MINERAL PROCESSING
3 Major Mineral Processors

Nyrstar, BHP & GFG Alliance

MINES & DEVELOPING PROJECTS
$4.4 Billion Production
$150.7 Million Royalties
MRD Production returns
MRD Royalties 2017-18

MINERAL PROJECTS
$955 Million Capital Expenditure
Company releases

MINERAL EXPLORATION
$55.2 Million Exploration Expenditure

180 companies
700+ mineral exploration licences

- Olympic Dam (Cu-U-Au-Ag)
- Prominent Hill (Cu-Ag)
- Kanmantoo (Cu-Au)
- Four Mile (U)
- Beverley (U)
- Jacinta-Ambrosia (H)
- Middleback Range (Fe₂O₃, Fe₅O₇)
- Calm Hill (Fe₂O₃, Cu, Au)
- Challenger (Au)
- Tarcuoca (Au)
- White Dam (Au)
- Carrapateena (Au)

*Operating Mines; Tunnel constructions; Miners leave Grantex; PCare and Maintenance

- Arkaranga (Coal)
- Atacama (H)
- Barra (Au)
- Bird-in-Hand (Au)
- Bungalow (Fe₂O₃)
- Crocker Well (U)
- Flinders (Zn)
- Fission (Fe₂O₃)
- Gould's Dam (U)
- Hawks Nest (Fe₂O₃, Fe₅O₇)
- Junction Dam (U)
- Kalkaroo (Cu-Au)
- Khanmion (Cu-Au-Ag)
- Maldoroy (Fe₂O₃)
- Menininni Dam (Ag-Pb-Zn)
- Mount Gunson (Cu-Co)
- Mutoroore (Cu-Co)
- Mutoroore Magnetite (Fe₂O₃)
- North Portia (Cu-Au-Mo)
- Oakdale (graphite)
- Paris (Ag)
- Poochera (kaolin)
- Razorback (Fe₂O₃)
- Samphire (U)
- Sivour (graphite)
- Sneefer (Fe₂O₃)
- Sonoran (H)
- Triptaka (H)
- Tunkilla (Au)
- Typhoon (H)
- Weednanna (Au)

EX2018 statistics
South Australian Copper to the World

- Accelerate exploration, discovery and information
- Develop innovative infrastructure, services and research
- Engage to build industry and community capacity
COPPER to the WORLD
2019 CONFERENCE

17-18 June 2019 • ADELAIDE • #C2TW

SA’s Energy Transition Snapshot

• One of the world’s highest penetrations of renewable energy.
• 48% renewable energy generation in 2017/18.
  • 39% large scale wind (19 wind farms)
  • 9% solar PV
• AEMO projects ~73% renewable energy generation in 2020/21
• A pipeline of large scale wind, solar and energy storage projects > 14GW / $21B
• One of the most distributed grids globally
Currently operating
- 1,809MW wind
- 122MW utility solar PV

Under construction or development
- 4,000MW wind
- 5,700MW utility solar PV
- 2,700MW battery
- 1,400MW pumped hydro
- 190MW solar thermal/hydrogen turbine/biogas turbine/compressed air

"~ $4B investment"

Large scale renewable and energy storage pipeline in SA

Large Scale Renewable Energy and Energy Storage Pipeline South Australia - March 2019
Under Construction and Under Development

Currently operating
Circa $4B worth of investment over ~10 yrs
- 1,809MW wind
- 122MW utility solar PV

Under construction or under development
Circa $21B worth of investment
- 4,000MW wind
- 5,700MW solar PV
- 2,700MW battery
- 1,400MW pumped hydro
- 190MW solar thermal/hydrogen turbine/biogas turbine/compressed air

Capital Expenditure ($m) Generation Source
- 100 - 250
- 250 - 500
- 500 - 1,000
- 1,000 - 2,000
- Battery
- Solar
- Hydrogen
- Compressed Air

Electricity Transmission

"~ $21B investment"
World’s Largest Battery

- First project funded from Renewable Technology Fund
- Provides security services and generation capacity
- Gives additional system stability to South Australia
Gupta steps up $1.37b renewable energy build near Whyalla steelworks
Santos to convert 56 crude oil pumps to 100% solar and battery storage.
SA Contracts SIMEC ZEN Energy to Expedite its Switch to 100% Renewables
DEM Energy Transition
Priority Initiatives for 2019

• Deliver the pillars of the Government’s energy policy
  • Home Battery Scheme
  • Grid Scale Storage Fund
  • Interconnector
  • Demand Management Trials

• Hydrogen
  • Support the development of a National Hydrogen Strategy
  • Submit the business case(s) to support hydrogen mobility and hydrogen research, development and innovation

• Develop an Electric Vehicle policy (both battery EV and fuel cell EV)
• Pursue other economic opportunities for South Australia from the global transition to a low carbon energy system
**Tonsley** brings together

- leading-edge research and education institutions
- established businesses and start-ups
- business incubators and accelerators
- government and the wider community

Connect and collaborate in Australia’s leading innovation district.
Hydrogen Park SA
Australian Gas Infrastructure Group

- Led by Australian Gas Infrastructure Group (AGIG), hydrogen will be produced from renewable energy and water
- AGIG will inject hydrogen into its natural gas networks as a step towards a 100% hydrogen network
- Construction commencement Q2 2019:
  - 1.25 MW electrolyser
  - up to 480 kg hydrogen per day
  - 2020 planned operation
- Achievable and short-term hydrogen production project with significant future growth potential
Invitation to the International Conference on Hydrogen Safety
24-26 September 2019, Adelaide, South Australia
South Australia Drill Core Reference Library
Delivering quality, accessible geological and environmental data
130 YEARS OF GEO科学发展 Information

700 GIS Datasets

- 280,000 drillholes
- 315GB seismic data
- 8,000km drill core material
- 350,000 locations with geochemistry
- 160 GB geophysical surveys
- 50GB geophysical imagery
- 322GB publications reports
- 15% Tenement regulation
- 10% Land Community
- 10% Infrastructure
- 65% Geoscience
- 436.5 GB data products delivered from the cloud
- 170 web services
- 9 investment dashboards

BIG DATA TRANSFER

South Australian Centre of Excellence in Predictive Analytics

- Established **South Australian Centre of Excellence in Predictive Analytics** in 2016

- Integrating innovative technologies developed by South Australian Companies into mining and energy operations nationally and globally.

- Project partners
  - SANTOS
  - IPACS (a South Australian technology company),
  - IBM, SKF, OSIsoft and Schneider Electric.

Project has created a South Australian-based commercial centre to service SANTOS and other resource companies using data analytics to lower the costs of production.
Lot 14 World Innovation Leader

- A creative and innovative neighbourhood for researchers and entrepreneurs

- Nurturing talent and driving job creation in fast-growing industries:
  - Artificial intelligence
  - Cyber security
  - Smart sensor networks
  - Robotics
  - Big data
  - Defence and space technologies
  - Media and creative industries

Lot 14 innovation hub established at the old Royal Adelaide Hospital site.
South Australian companies Consilium Technology and Scantech International have developed an Intelligent Control (IC) system for Nutrien (headquartered in Canada) - one of the world's largest fertiliser manufacturers.

At Nutrien's Aurora Plant in North Carolina, Scantech's Geoscan on-belt analysers measure the content of incoming phosphate rock.

The IC system, then controls the addition of sulphuric acid to the reactor to optimise the chemical balance and maximise the phosphate yield. The technology is being marketed globally to existing and new Geoscan users as an extension of capability.
Chrysos Corporation has developed, assembled and commercialised a chemical free, non-destructive Photon Assay unit that provides accurate and fully automated analysis of ore grade.

The method is well suited to replace conventional fire-assay for gold, but can also be used to measure other elements including copper, silver, lead, zinc and uranium.

The technology has so far generated international interest from Africa, North America and Central America.
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