



Building Professional Engineering & Technology Capability

Mike Griffin, Chief Executive, The Australian Power Institute

OVERVIEW:

1. ABOUT API
2. FUTURE WORKFORCE SKILLING IMPACTS
3. FACILITATING INNOVATION

Connects. Collaborates. Contributes.

VISION:

Connecting People, Skills and Resources to Power Australia's Energy Future.

VALUE PROPOSITION:

API provides value through maximising collaboration and innovation throughout the energy industry, universities and schools, professional bodies and government in power engineering education, research and training.



API VALUE LIFECYCLE

"a day in the life of a 7 year-old"

A project to promote STEM in early years of primary school

Supporting UQ women in engineering program



Bursary and Vacation Work Program



Industry / university partnership providing applied research and innovation



Annual two week summer school

Primary School
Lifting the profile of technical role models

High School
STEM as career door opener

University
Diverse graduates that are energy industry job ready

Workplace
Top up skills and broaden horizons

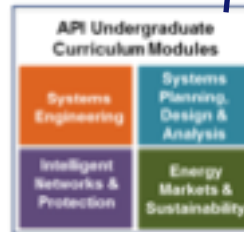
Tomorrow's technical leaders equipped to deliver Australia's energy future

API sponsored ATSE STELR Solar Car Challenge



Education and industry support opportunities for indigenous students

Providing industry relevant content for use by all universities



Feedback: is supply meeting demand?



Systems & Commissioning Masterclass - Perth



API collaborating partners on key initiatives



**SMART ENERGY
COUNCIL**
SOLAR, STORAGE, SMART ENERGY

Governor Members



Part of the Energy Queensland Group



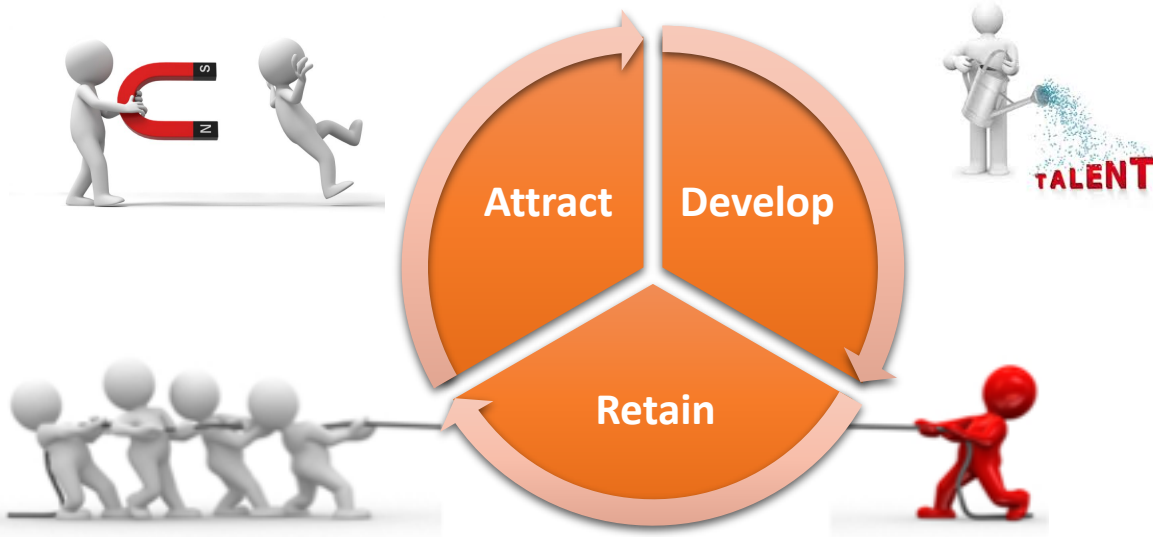
Principal Members



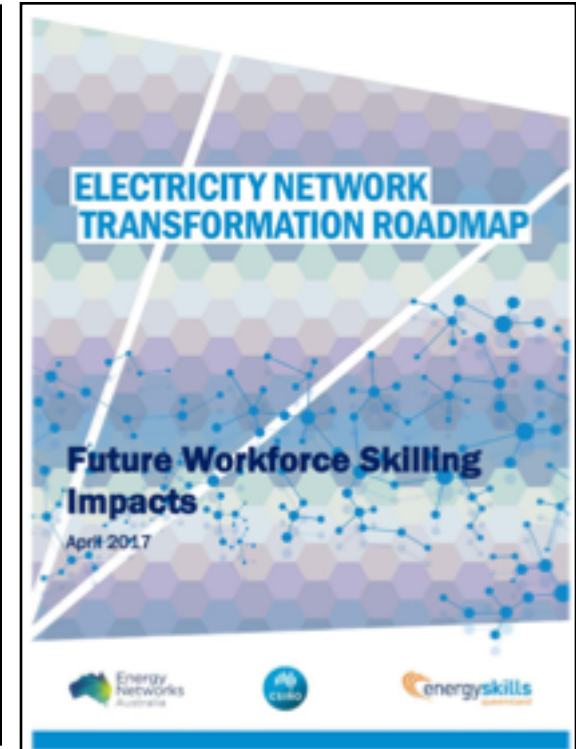
Industry Members



Now, more than ever, energy businesses are needing to **attract, develop and retain** a consistent pipeline of **power engineering and technology talent** coupled with **innovative thinking** to guide Australia's energy industry through this time of critical change.



Future of work/jobs



Electricity Network Transformation Roadmap (ENTR – referred to as ‘the Roadmap’)

Figure 2 - Identified technical streams of skills (both engineering and non-engineering) ESI companies require from the future power engineers



Source: API Workforce Planning Report 2015

FUTURE WORKFORCE SKILLING IMPACTS

Highlights from Energy Skills Queensland (2017) Electricity Network Transformation Roadmap Report

April 2017

FUTURE SKILLS ANALYTICS

Enterprise skills will be essential for employees in all occupations within the network workforce, enterprise skills include;

- digital literacy
- creativity
- communication
- complex problem-solving

ENGINEERING WORKFORCE ENABLING GROUP

Roles of the following Electrical Engineering qualified workers were identified as essential:

- Power System Engineers
- Network Planners
- Protection Engineers
- Asset Managers
- Environmental Engineers.

ENGINEERING WORKFORCE ENABLING GROUP

Essential Skill Sets include:

- Behind meter technologies (batteries, inverters and electric vehicles)
- Advanced Information Communication Technology (ICT) network knowledge including concepts such as Internet of Things (IoT) and IEC61850
- Ability to work with Big Data
- Working knowledge of big data software/programming such as R/Python
- Risk management

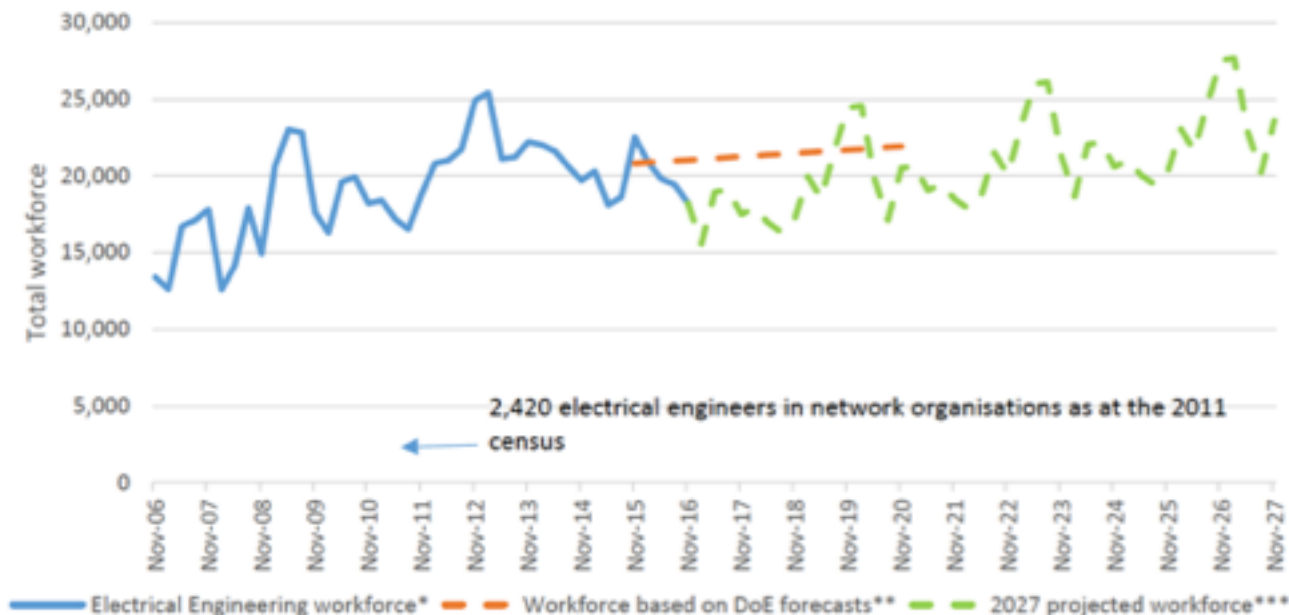
CHANGING INDUSTRY - CHANGING WORKFORCE

“Engineering workforce within distribution network operators will experience a strong impact, as a result of the implementation of technologies contributing to the establishment of a smart grid. The catalysts for this impact were identified as the emergence of new types of integrative engineering skills, requiring a robust understanding of power engineering, electrical engineering, IT, bi-directional networks, intelligent networks, solar PV integration, data and telecommunications.”

EMPLOYMENT: ELECTRICAL ENGINEERS

Figure 15 - Electrical Engineers national employment trend across all industries

By 2020, Electrical Engineering employment levels predicted to increase by 1,100 employees (or 5.4%) on the November 2015 equivalent, to 21,900.



(Australian Bureau of Statistics-- Category 6291.0.55.003), ** (Australian Government: Department of Employment, 2016)

***Projected 2027 workforce has been calculated based on the workforce trend experienced between November 06 and November 2016

API WORKFORCE PLANNING SURVEY 2017

BUILDING CAPABILITY - GRADUATES

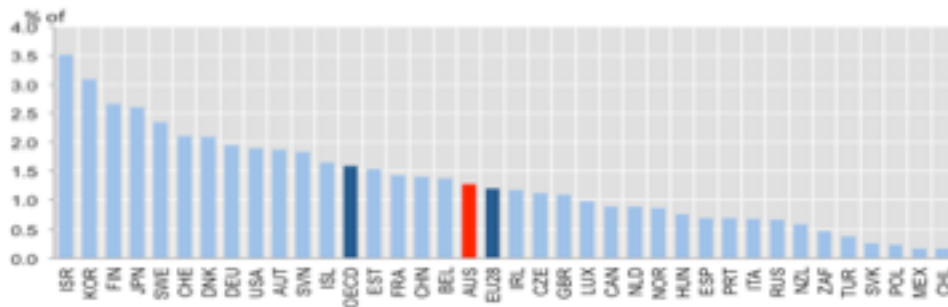
- Personal attributes and non-technical skills
- Work readiness
- Increased understanding of commercial and business fundamentals
- Improved technical skills & understanding of new technologies
- Project Management

FACILITATING INNOVATION:

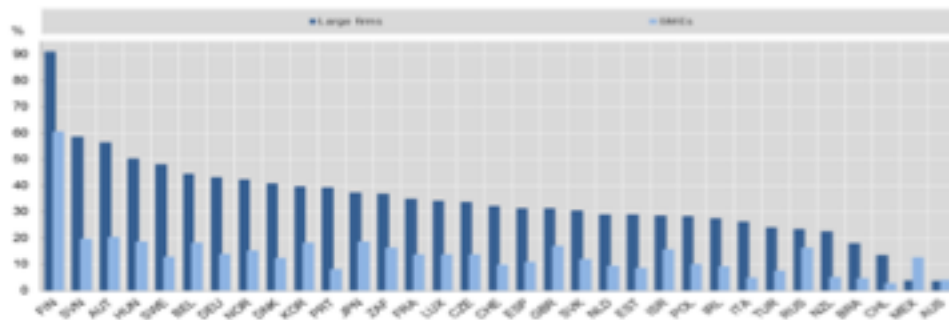
- Innovation = ideas successfully applied
- API & ENA innovation framework & process
- Doing things differently
 - Industry led innovation & research.
 - True collaboration between industry & universities – based on best capability to match delivery of project including multidisciplinary collaborative teams of universities and/or small-medium enterprise partners.
 - Broaden research perspective beyond technical to include identification & realisation of efficiencies and improve service delivery.
 - Provide for translation of research into action & realised benefits.

FACILITATING INNOVATION:

AUSTRALIA RANKS LOW ON INTERNATIONAL COMPARISON



**Business enterprise expenditure on R&D, 2001 and 2011
as a percentage of GDP**

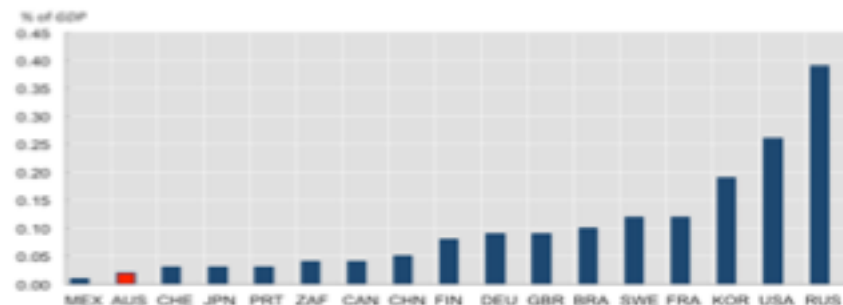


**Firms collaborating on innovation with higher education or public
research institutions**

SOURCE:

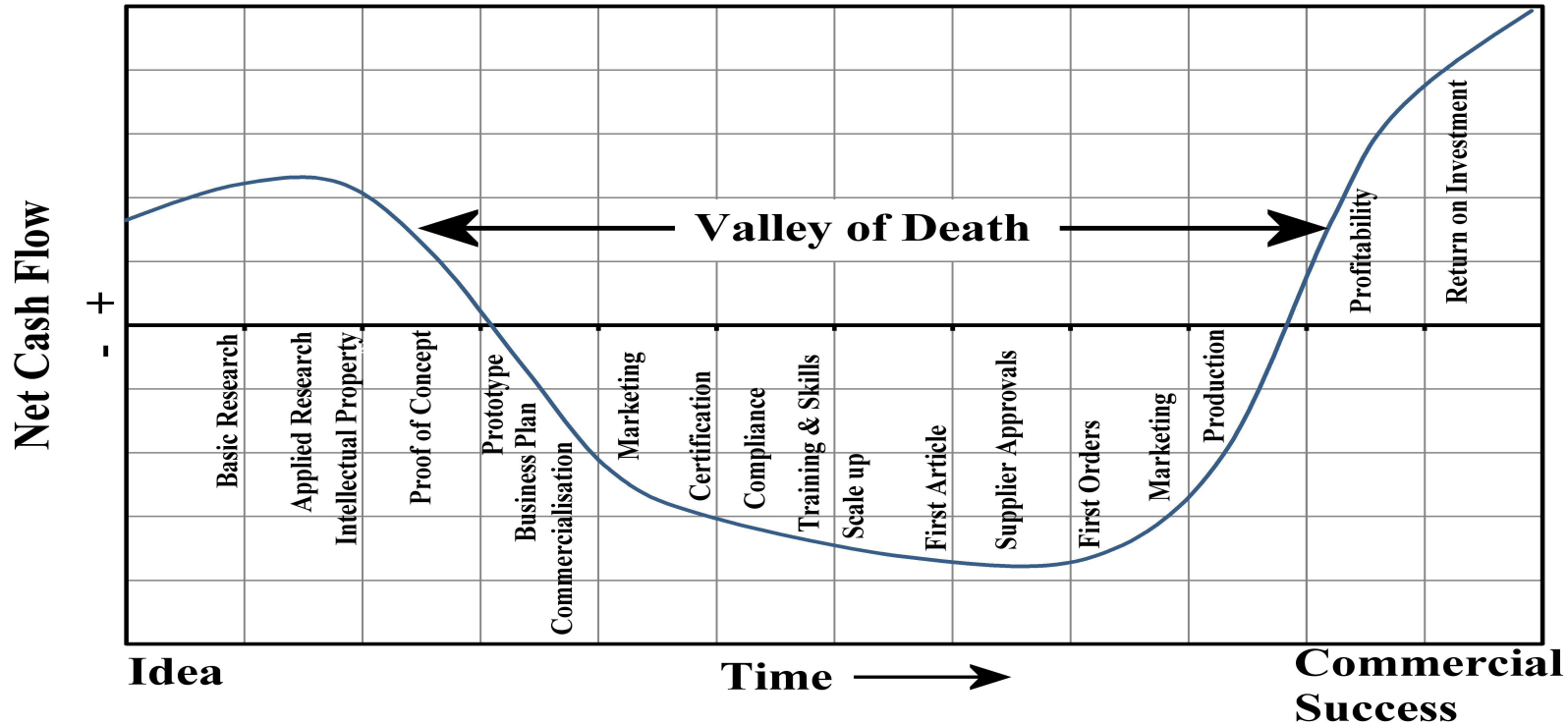
ATSE Article: "Innovation policy linked
to productivity boost"

By John Bell



**Direct government funding of
business R&D - 2011**

Source: April FOCUS Magazine 'Getting the Best from Research" by Roger Lumley



CONCLUSION:

Future capability actions required:

1. Stay up to date with technology
2. Increase commercial/entrepreneurial skills
3. Be agile, innovation & proactive
4. Innovation = ideas successfully applied



The Australian Power Institute

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