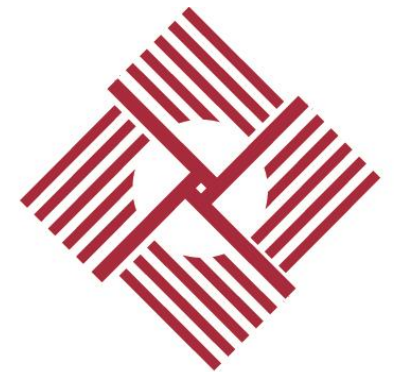


AOG 2019

**Opportunities for New Energy
and Efficiency Improvement on
Oil & Gas Assets**



ASSET MANAGEMENT COUNCIL

Anselm Boehl

Asset Management Council WA Chapter Chair

enabling value from effective asset management

Helping to answer the big questions in Asset Management

through fostering:

- Professional recognition
- Professional collaboration
- Information sharing
- Development of an Asset Management Body of Knowledge (AMBOK)



ASSET MANAGEMENT COUNCIL

ASSET MANAGEMENT

AMPEAK

PROMOTE EDUCATE ASSIST KNOWLEDGE

2019



ASSET MANAGEMENT COUNCIL

THE MEETING PLACE FOR ASSET MANAGEMENT

Sun 7 – Wed 10 April 2019

The Esplanade Hotel Fremantle
by Rydges, Fremantle WA

- AMPEAK Conference held annually in various State locations

- Local Chapter events
- Forums

www.amcouncil.com.au

Colby Hauser

Regional Manager - Upstream Production Solutions
Vice President – Petroleum Club of WA



Colby brings a strong commercial background from both operator and contractor perspectives, with a focus on the Oil & Gas operations and maintenance market.

Focus areas:

- Mature oil and gas infrastructure
 - FPSOs
 - Domestic gas plants
 - Onshore oil production facilities
- Domestic and international operating models
- Contracting and outsourcing models

plan.operate.maintain.optimise

Project in focus:

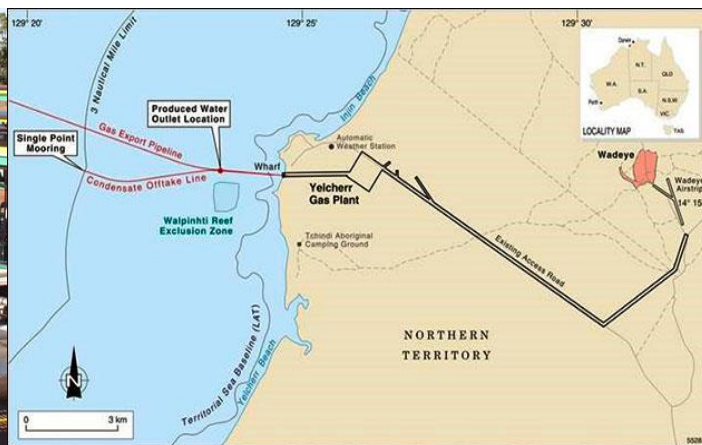
Client: Eni Australia – Blacktip / Yelcherr Gas Plant

Scope: Engineering, Procurement & Maintenance Services

Upstream PS provides ongoing efficient and safe **maintenance** of the onshore and offshore facilities as part of an integrated team on a domestic gas facility in the NT.

Detailed scope:

- All routine and campaign maintenance of the wellhead platform, single point mooring and the onshore gas facility
- Shutdown / turnarounds
- Planning, procurement & expediting
- CMMS (SAP) entry and management
- Supplementary operations support



Introductions and thought provokers

Mary Hackett – LNG Marine Fuel Institute



John O'Brien – Deloitte



Francis Norman – NERA



Ray Wills – Future Smart Strategies



Opportunities for new energy and efficiency improvement in oil & gas assets

Discussing ways to improve the **identification**, **evaluation** and **implementation** of energy efficiency opportunities on oil and gas projects.

- Facilitated panel session
- Open up to the forum for questions

Oil & gas industry transformation



Director – LNG Marine Fuel Institute

Chair – Industry Advisory Board, Curtin School of Science and Engineering

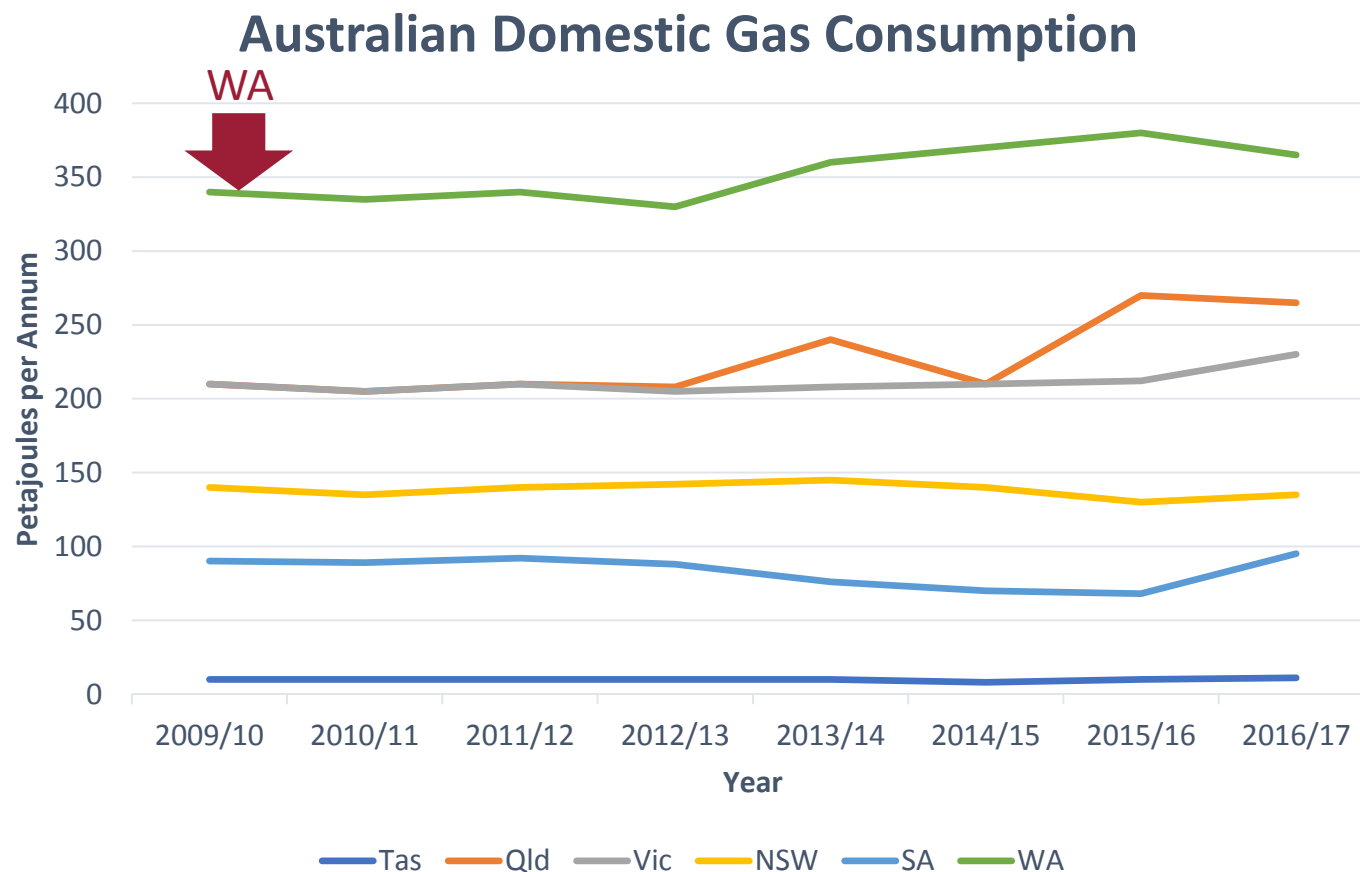
During a 30 year career with Baker Hughes (GE), Woodside, and Brown & Root, Mary has amassed a wealth of experience drawing on technical expertise, operational excellence, project management, and field development, through to total business delivery.

Focus areas:

- Hydrocarbons
- Transition to alternative fuels
- Collaboration and diversity

Gas in our State

- Yes – LNG at a global scale
- Domestic gas market – WA in superior position
- Industry can flourish against this great backdrop

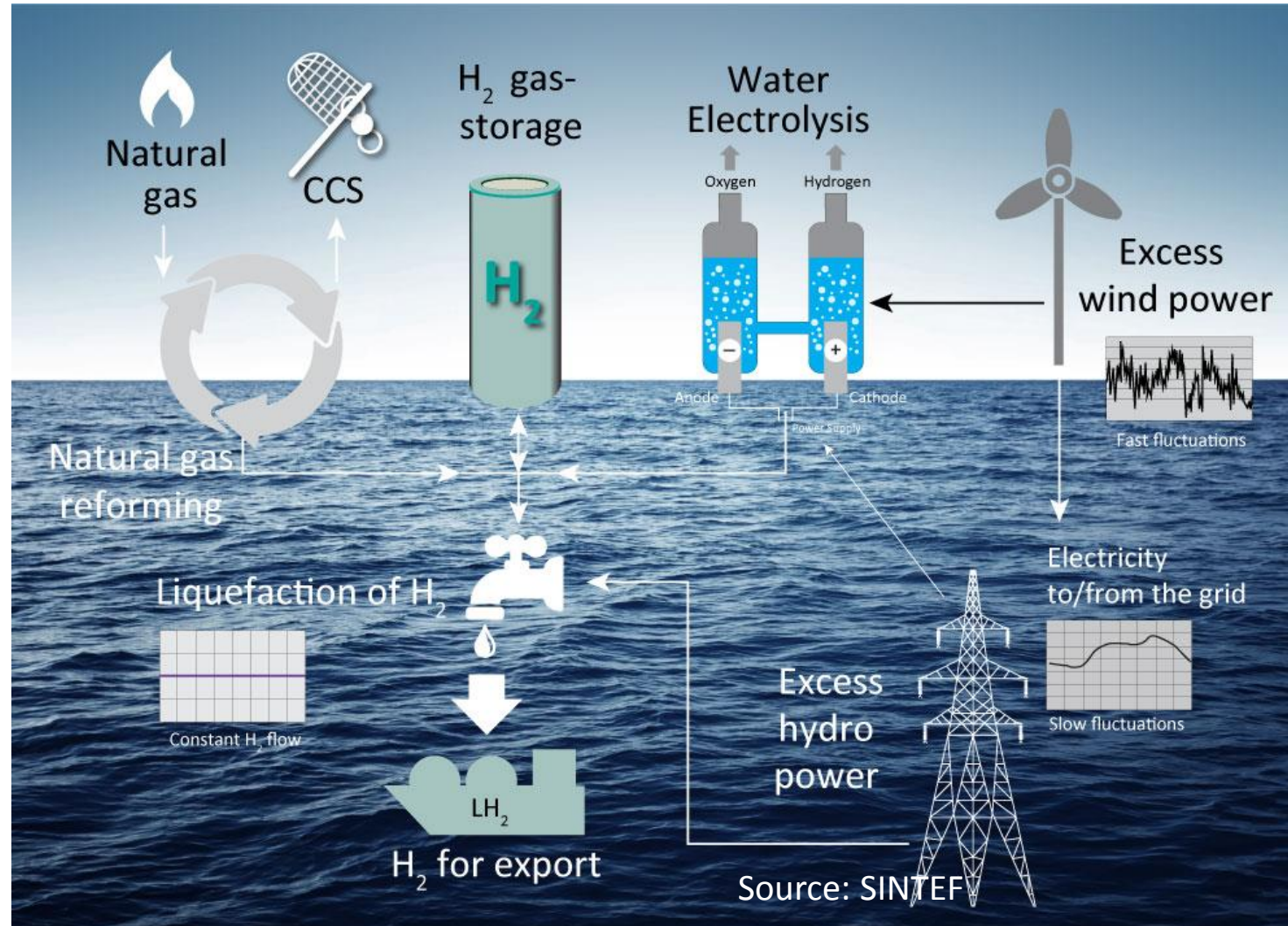


Western Australian gas economy

		Value to WA	Industry Value	Employs
LNG export		\$5.7 bn	\$25 bn	
Domestic use	TOTAL Domestic	\$3.9 bn	Supports \$165 bn industry employing 240,000	18,000 people directly
	Mining	\$1.2 bn		
	Manufacturing & mineral processing	\$0.8 bn		
	Utilities	\$0.5 bn		
	Transport logistics	\$0.3 bn		
	Construction	\$0.1bn		
	Other	\$0.5 bn		

Source: DMIRS

Blue to green hydrogen



Gas to fuel the future

- Natural gas and LNG as our primary fuel
- Australia is incentivised to use Australian gas
- Move to broader products: From **gas** to **ammonia** to **hydrogen** to **new energy**
- WA as a hub of technology, critical resources and manufacturing

Clean technology is going mainstream



Partner, Energy Transition & Renewables – Deloitte
Advisory Panel Member – Australian Renewable Energy Agency
(ARENA)

John draws upon his 20+ years' experience in the Australian energy sector to advise Government, private sector operators, large energy consumers and investors on clean energy and clean technology strategies and projects.

Focus areas:

- Clean energy and technology
- Strategy and export growth
- Industry development



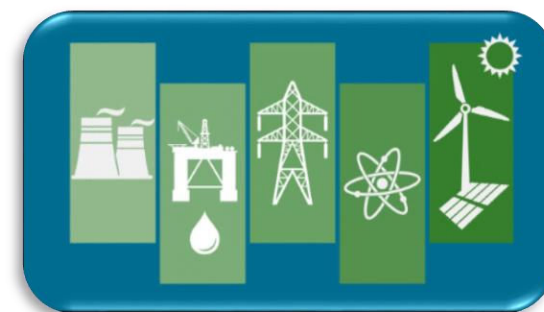
High School teacher,
Nova Scotia



Structural Design,
London & Adelaide



Corporate Development,
Origin Energy



Energy Transition &
Clean Technology
Deployment



Wireline Engineer,
North Sea & Syria



Project Management
& Asset Management,
Origin Energy



Clean Technology
Development,
Australian CleanTech

Deloitte energy transition team

Building Australia's leading energy transition advisory team

Facilitating connections between incumbent and emerging energy solutions.



DECARBONISED



DECENTRALISED



DIGITALISED

Energy Transition Participants

Governments & Regulators	Federal, State, City
Energy sector participants	Incumbents and new entrants
Large Energy Consumers	Industrials & governments
Technology Providers	Australian and global
Project Developers	Wind, solar, batteries, H2
Investors	Pipeline development & DD

Focus

Policy	Development, analysis and advice
Modelling	Energy market modelling
Strategy	Technology, economics & deployment
Growth	Strategy and market entry options
Finance	Energy project funding strategy
Regulatory	Strategy, submissions and review
Scenario planning	Emissions & technology paths
Asia	Inbound & outbound

Vital connections for innovation



General Manager Innovation and Strategy – NERA
Independent Director – Subsea Innovation Cluster
WA Division Committee Member and past president – Engineers Australia

Francis is an engineer and manager with almost 40 years of resources experience, working as a General Manager with NERA, he supports growth of the energy resources sector through facilitating collaboration and cooperation.

Focus areas:

- Energy resources
- Clusters
- Emerging technology

Addressing oil & gas challenges and opportunities

Digital & Automation

Maintenance & Operational Optimisation

Decommissioning

Industry & Research Collaboration

Supply Chain Clusters & Export Hubs

Optimise Regulatory and standards frameworks

Clean Technologies and New Energy

Skills & Workforce Transition



Industry case studies

Maintenance and operational optimisation

- Virtual operating environment
- Deployed IIOT sensors
- Data processed through machine learning
- Santos (Quadrant) plus multiple tech suppliers



Hybrid CSG wellsite power

- Solar battery generator packages comprising 3 key elements
- Deliver 8 – 32kW of power
- Reduced generator operating hours and maintenance costs



Transforming Australia's Subsea Equipment Reliability (TASER)

- Collaborating to assess innovative solutions against marine organism growth on subsea equipment
- Aim to reduce intervention campaigns



Australia's energy future



Managing Director – Future Smart Strategies
Expert in Residence – CORE Innovation Hub

Professor Ray Wills has had a wide-ranging career at different times as researcher, academic, planner, consultant, adviser, manager, executive - and futurist. Ray's diverse experience has developed an exceptional network across the political and administrative arms of government, as well as business and the broader community. Ray is recognised as one of the top 100 global leaders in sustainability.

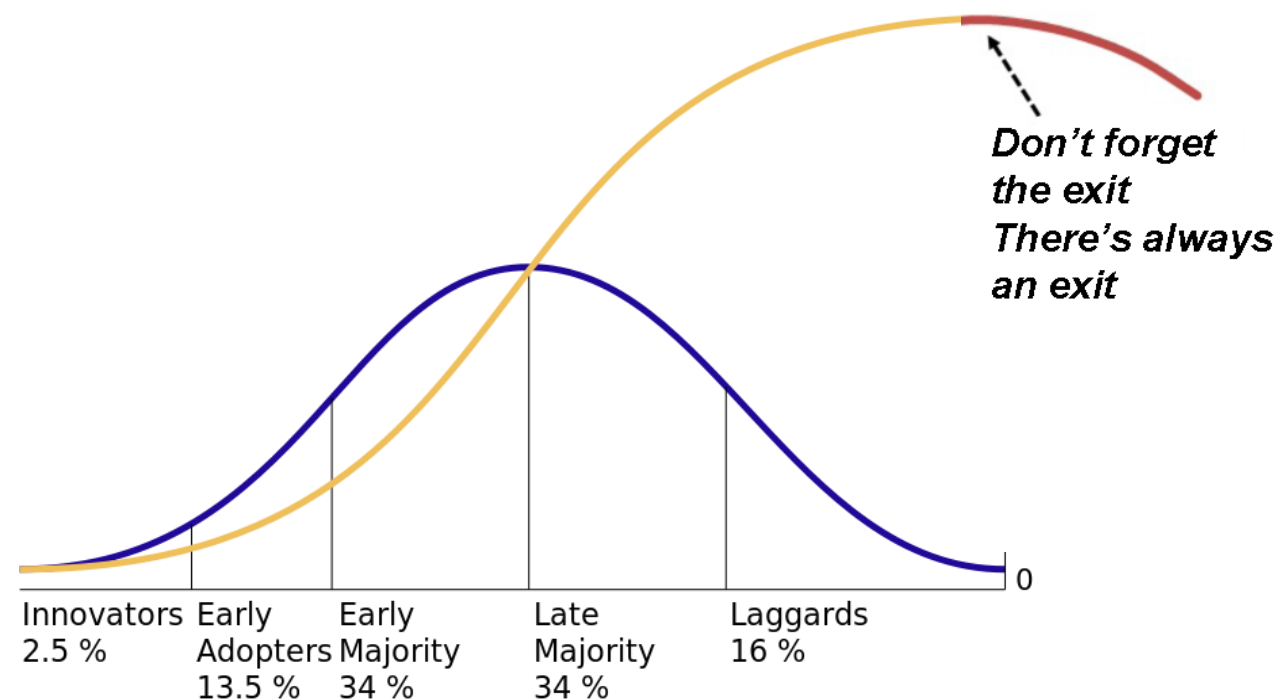
Focus areas:

- Climate and energy
- Renewables, built environment and smart cities
- Electrification, mobility and new technology

Future Smart Strategies
Business | Innovation | Sustainability

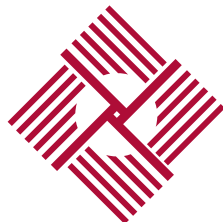
The world is changing quickly

- Ask yourself: is the technology I used 2 or 5 years ago even still relevant?
- Globally, forecast growth of renewables has been inadequate
- Lack of knowledge can lead to a BAU mentality and legacy investment
- If we play at the fringes, we are missing the change
- Those that focus on efficiency and energy will have margin advantage
- IoT sensors are making automation through robotics and drone possible
- Future operations will run on predictive data analytics supported by AI





Our panel



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