



Process Manufacturing, Recreational Vehicle and Laboratory Industry Reference Committee (IRC)

MSL Laboratory Operations Training Package

Industry Proposal

November 2017

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*Prepared on behalf of the Process Manufacturing, Recreational Vehicles and Laboratory IRC
for the Australian Industry Skills Committee (AISC)*

**Process Manufacturing, Recreational Vehicles and Laboratory Industry Reference Committee
Industry Proposal November 2017**

This Process Manufacturing, Recreational Vehicle and Laboratory Industry Reference Committee *Industry Proposal* has been produced with the assistance of funding provided by the Commonwealth Government through the Department of Education and Training.



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Part 1 – Your details

1.1. Please provide your details below

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Organisation (If applicable)	Manufacturing Service Skills Organisation (IBSA Manufacturing) on behalf of the Queensland Department of Education and Training, and in conjunction with the Process Manufacturing, Recreational Vehicle and Laboratory Industry Reference Committee (IRC)
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1.2. Please identify which categories describe you best. More than one can be selected as applicable.

- | | |
|-----------------------------------|-------------------------------------|
| Employer | <input type="checkbox"/> |
| Enterprise | <input type="checkbox"/> |
| Student | <input type="checkbox"/> |
| Individual | <input type="checkbox"/> |
| Skills Service Organisation | <input checked="" type="checkbox"/> |
| Industry Reference Committee | <input checked="" type="checkbox"/> |
| Training provider | <input type="checkbox"/> |
| Trade union | <input type="checkbox"/> |
| Regulator | <input type="checkbox"/> |
| Industry association or peak body | <input type="checkbox"/> |
| Employee association or peak body | <input type="checkbox"/> |
| Government body | <input checked="" type="checkbox"/> |
| Non-government body | <input type="checkbox"/> |
| Statutory authority | <input type="checkbox"/> |
| Other | <input type="checkbox"/> |

Part 2 – Industry Proposal

2.1. Skill or training need to be addressed

This industry proposal has been developed by IBSA Manufacturing based on a request from the Queensland Department of Education and Training. Their consultation with a number of companies representing sugar milling, abattoir operations, ethanol manufacturing and bio-diesel trials has identified that current training in laboratory qualifications may not be producing workers with the desired skills and knowledge in testing, sampling, analysis and interpretation of results. IBSA Manufacturing has undertaken further industry consultation to investigate training requirements in the new and emerging areas related to the renewable and sustainable energy sector, in bio-fuels and bio-processing of waste and agricultural products.

Initial research indicates that training in these areas should encompass the broader area of laboratory operations work in the bioenergy field with the subsets of biofuels and biomass. Bioenergy is a renewable energy derived from biological sources or waste and produces gaseous fuels to generate electricity and heat, or liquid fuels for transport.

This proposal is to undertake broader scoping activities, consultation and analysis of the MSL training package to scope the required skills and knowledge by:

- reviewing the following qualifications against the scope of laboratory operations requirements in biofuel and biomass to identify gaps:
 - MSL30116- Certificate III in Laboratory Skills
 - MSL40116- Certificate IV in Laboratory Techniques
 - MSL50116- Diploma of Laboratory Technology
 - MSL60116 Advanced Diploma of Laboratory Operations
- identifying if discreet units need to be developed or current units can be modified
- identifying what type of skills sets are required to support the full range of job role in this emerging area
- identifying which qualifications are particularly related to the requirements in this sector.

2.2. Rationale for addressing the issue via Industry Proposal

Rationale for this work

This work is a priority area as it is an emerging industry need and no training currently exists. There is a particular need in Queensland where the industry is being established with federal and state government incentives.

Advantages and benefits of this work

With the rise in global energy demand, the importance of biofuels and bioenergy as alternative energy sources has grown significantly. Australia's current installed bioenergy generation capacity significantly lags the OECD average, and delivering on this market potential will leverage Australian strengths in research and development, agriculture, water and land, and provide significant rural and regional jobs, firm renewable electricity, renewable heat and gas and biofuels.¹ In the United States and Europe, the bioenergy industry is significantly developed and they both have renewable energy and biofuel targets. In the United States, energy independence and fuel security have been key drivers of recent biofuels activity, whereas Europe has placed a greater focus on emission reduction goals.² In 2013, biomass and waste accounted for almost a quarter of the Swedish energy supply.³

Australia's biofuel's policy sits at the intersection of energy, environmental and regional development policies and as a result should not be viewed in isolation.⁴ Developments with these renewable energies offer economic benefits to regional communities.⁵

The Commonwealth government funds the *Clean Energy Finance Corporation (CEFC)* and the *Australian Renewable Energy Agency (ARENA)* to support jobs and innovation through investment in clean and renewable energy in Australia. The Clean Energy Finance Corporation (CEFC) has created a \$100 million dedicated fund for bioenergy projects – *the Australian Bioenergy Fund* – in recognition of the significant potential for bioenergy to contribute to renewable energy, biofuels and carbon emissions. ARENA has funded developments (\$2.65 million) in bio fuels including Northern Oils Advanced Bio Fuels laboratory, Southern Oil Refining Pty Ltd (Southern Oil Refining or SOR)⁶

This bio sector focus' on the manufacture of products from sustainable organic and/or waste resources into a diverse range of bioproducts such as sustainable chemicals, fuels, synthetic rubber, cosmetics, detergents and textiles. Innovative scientific and industrial technologies create bioproducts which are renewable and provide environmentally beneficial alternatives to existing conventional chemical and fossil fuel refining processes.⁷

¹ <https://www.cefc.com.au/where-we-invest/bioenergy.aspx>

² LEK Consulting (2011) *Advanced Biofuels study*

³ Ericsson, K & Werner, S (2016) *The introduction and expansion of biomass use in Swedish district heating systems* Science Direct.

⁴ LEK Consulting (2011) *Advanced Biofuels study*

⁵ Ernst Young (2012) *Fuelled for growth: Investing in Victoria's biofuels and bioenergy industries*

⁶ <https://arena.gov.au/projects/northern-oil-advanced-biofuels-laboratory/>

⁷ State of Queensland, Department of State Development (2016)

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Recognising this, the *Australian Renewable Energy Agency (ARENA)* has invested in an advanced biofuels laboratory being built near Gladstone in southern Queensland by Southern Oil Refining. This pilot plant will use biomass material such as sugarcane bagasse and prickly acacia as feedstock for the production of bio crude oil, which will be refined into saleable kerosene and diesel products.

The development of the industrial biotechnology and bioproducts sector is a priority for the Queensland Government and reflected in its Biofutures Roadmap.⁸ It is projected to help create thousands of jobs and a new high-value, knowledge-intensive industry in Queensland and Australia, particularly in rural areas and regional centres. It encompasses a spectrum of innovative scientific and industrial technologies designed to convert sustainable grains, feedstocks and waste into a diverse range of by-products. Agriculture, plantation forestry, algae, organic and carbon-rich 'waste' streams could all be used as feedstocks and energy in the future.

A bio refinery is being established at Mackay with financial assistance from the Queensland government. This planned commercial-scale facility would have capacity to annually produce up to 26,000 tonnes of soymeal, 2000 tonnes of yeast products for the animal feed market and 15 mega litres of biodiesel suitable for heavy transport industries

Queensland and NSW have mandates on bio fuel. Queensland has a bioethanol mandate that starts at 3% and increases over time, and a biodiesel mandate of 0.5%. In NSW, a 6% ethanol mandate has been in place for some time, but as it currently provides exemptions only about 2.5% ethanol is blended into the fuel mix.⁹

The biofuel industry has created jobs, particularly in Queensland where two ethanol plants are operating. The United Plant at Dalby is currently at capacity and is considering further expansion which will create jobs. The Wilmar Plant at Sarina, near Mackay also supports the sugarcane industry.¹⁰

The Clean Energy Finance Corporation (CEFC) suggest that the energy from the waste market has considerable potential. NSW, Western Australia, Victoria, South Australia and the ACT are all developing facilities to convert waste. The CEFC supports projects from waste companies and councils who wish to develop energy from waste products.¹¹ Most states have energy from waste guidelines.¹²

The domestic aviation sector remains the major driver for developing the biofuels sector in Australia, with demand from the aviation industry to supply 5% of its domestic fuel use from biomass by 2020.¹³

⁸ <http://statedevelopment.qld.gov.au/industry-development/biofutures.html/>

⁹ Bell, G & De Jong, E 2016 *What is Australia's biofuel future?* <http://www.ecogeneration.com.au/what-is-australias-biofuel-future/>

¹⁰ <http://biofuelsassociation.com.au/>

¹¹ <https://www.cefc.com.au/where-we-invest/bioenergy.aspx>

¹² CEFC (2016) Energy from waste in Australia: a state-by-state update.

¹³ Murphy, H. T., O'Connell, D. A., Raison, R. J., Warden, A. C., Booth, T. H., Herr, A., ... & McIvor, J. G. (2015). Biomass production for sustainable aviation fuels: a regional case study in Queensland. *Renewable and Sustainable Energy Reviews*, 44, 738-750.

The *Australian Renewable Energy Training and Workforce Strategy for 2020* found that “too few undergraduate courses that cover renewable energy technologies are currently available.” *Renewable Energy Jobs in 2009 and Forecasts to 2020* shows 65 companies across Australia and 1,155 employed, not including downstream jobs in 2009. Bioenergy current employment intensity in Australia is higher than the international averages.

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2.3. Support for the Industry Proposal by stakeholders

The following stakeholders were consulted:

- Shahana McKenzie, CEO Bioenergy Australia, ACT.
- Heather Bone, Director, Bioenergy Australia, ACT.
- Gavin Hughes, CEO Biofuels Association of Australia, Sydney, NSW.
- Bradley Siddans, HR Manager, Oakley Beef Export, NH Foods, Oakley, Queensland.
- Ben Tabulo, Business Development Manager, Southern Oil Refineries, NSW.
- David Schaller, Lead Research Chemist, Northern Advanced Biofuels Laboratory, Northern Oil Refinery, Yarwun, Queensland.
- Brett Kuskopf, General Manager, Ethanol production company, United Dalby Bio-Refinery, Dalby Queensland.
- Heng Ho Wo, Manager Pilot Plant, Bioproducts production, Queensland University of Technology, Mackay, Queensland.
- Wendy Hughes, Communications Manager, MSF Sugar, Gordonvale, Queensland.
- John Lockhart, Business Development, Bio-diesel production, Bio Processing Australia, Borenore, Orange, NSW.
- Morgan Hunter, SA Biofuels, Adelaide & Tailem Bend, South Australia.
- Stelios Liberatos, QA Manager, Wilmar Ethanol Plant, Mackay (Melbourne based).
- Sam Nicolosi, VET Industry Advisor, QMISolutions, VET Industry Advisory Organisation, Springwood, Queensland.
- Darryl Outhwaite, Manager, WA Biofuels, Albany, WA.
- Mitch Lever, Energy Projects Engineer, WA Biofuels, Albany, WA.

Currently, there is a great deal of activity in this sector in Queensland. Companies from Victoria and NSW are setting up in Queensland and biofuel testing from South Australia has to be sent to Queensland, as there is no facility in SA. The renewable energy sector requires well trained personnel as more standards are being applied. Federal government regulations apply to the quality of petrol and diesel fuel in Australia.

Stakeholders were concerned about recruiting difficulties in regional areas (where bio-energy plants are located), and significant loss of quality within the sector as a result of inadequately skilled workers. The Queensland ITAB regarded this as a particular problem in the future because of the location and growth of facilities in remote locations. The Northern Advanced Biofuels Laboratory was employing a Certificate III Laboratory graduate in their facility and the United Dalby Bio-Refinery a Certificate IV.

The IRC supports further research and job analysis in this emerging industry in order to identify the required skills and knowledge to be included into the MSL Laboratory Operation Training Package.

IRC Signoff

This Industry Proposal was agreed to by the Process Manufacturing, Recreational Vehicles and Laboratory IRC.

Name of Chair

Signature of Chair

Date

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