

# オーストラリア北部地域における 持続可能な食品製造及びエネルギー供給事業の開発

2015年5月21日

株式会社野村総合研究所  
コンサルティング事業本部社会システムコンサルティング部  
パブリックマネジメントグループ

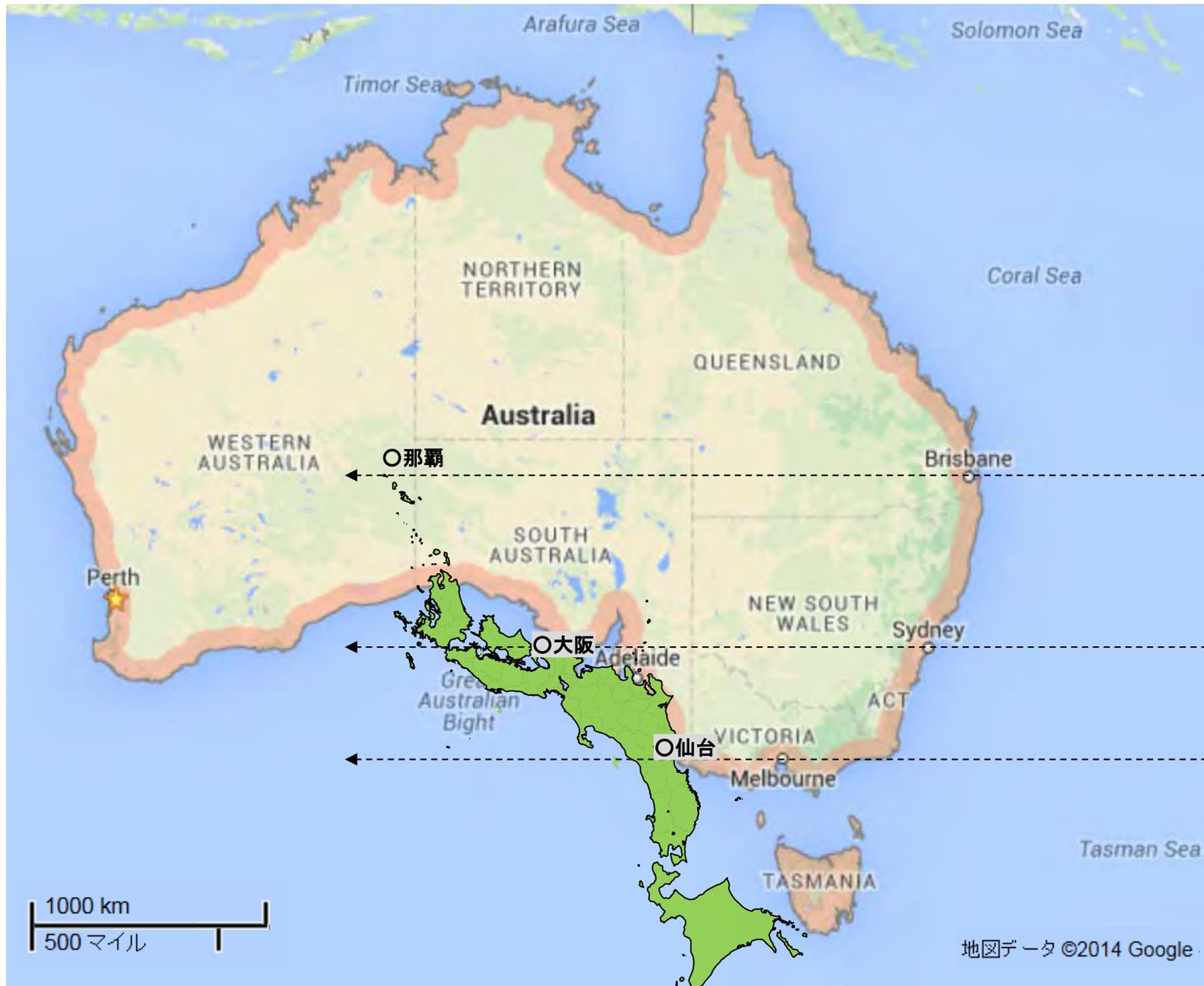
GM/上級コンサルタント 矢島 大輔

〒100-0005  
東京都千代田区丸の内1-6-5 丸の内北口ビル

# オーストラリアとは

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# 概要



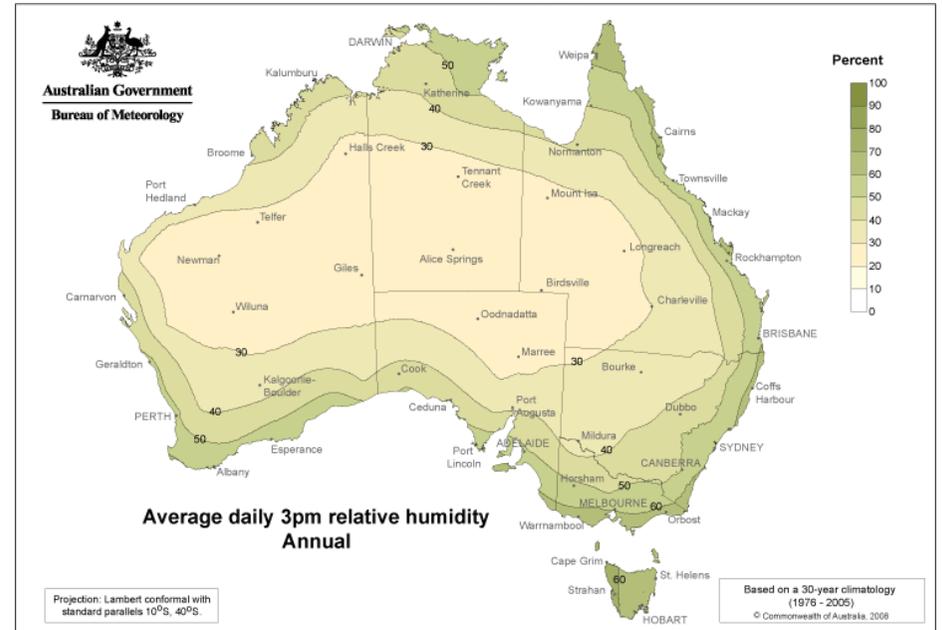
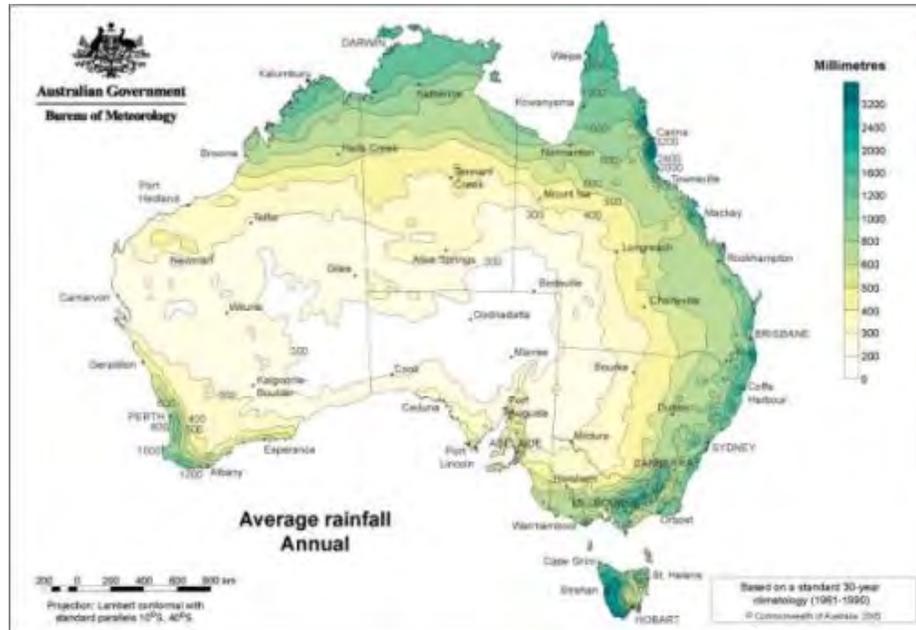
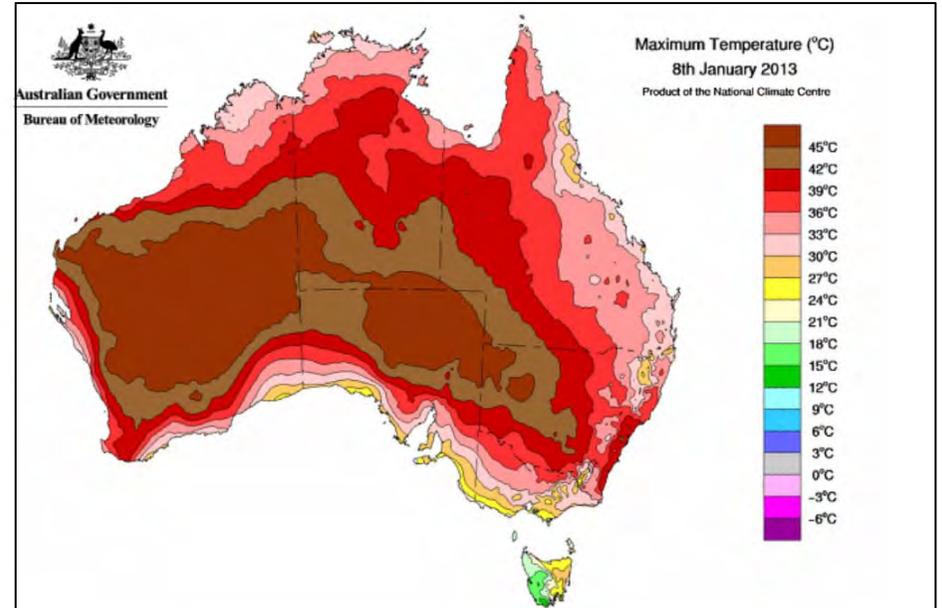
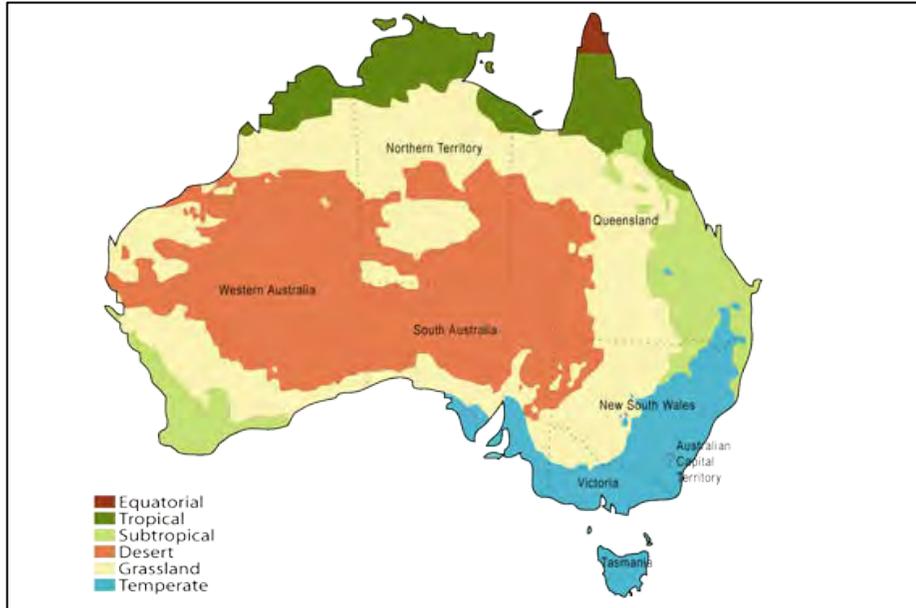
**オーストラリア**  
7.692百万km<sup>2</sup>  
23.7百万人  
GDP : 1.6兆USD/2013  
67,468USD/人

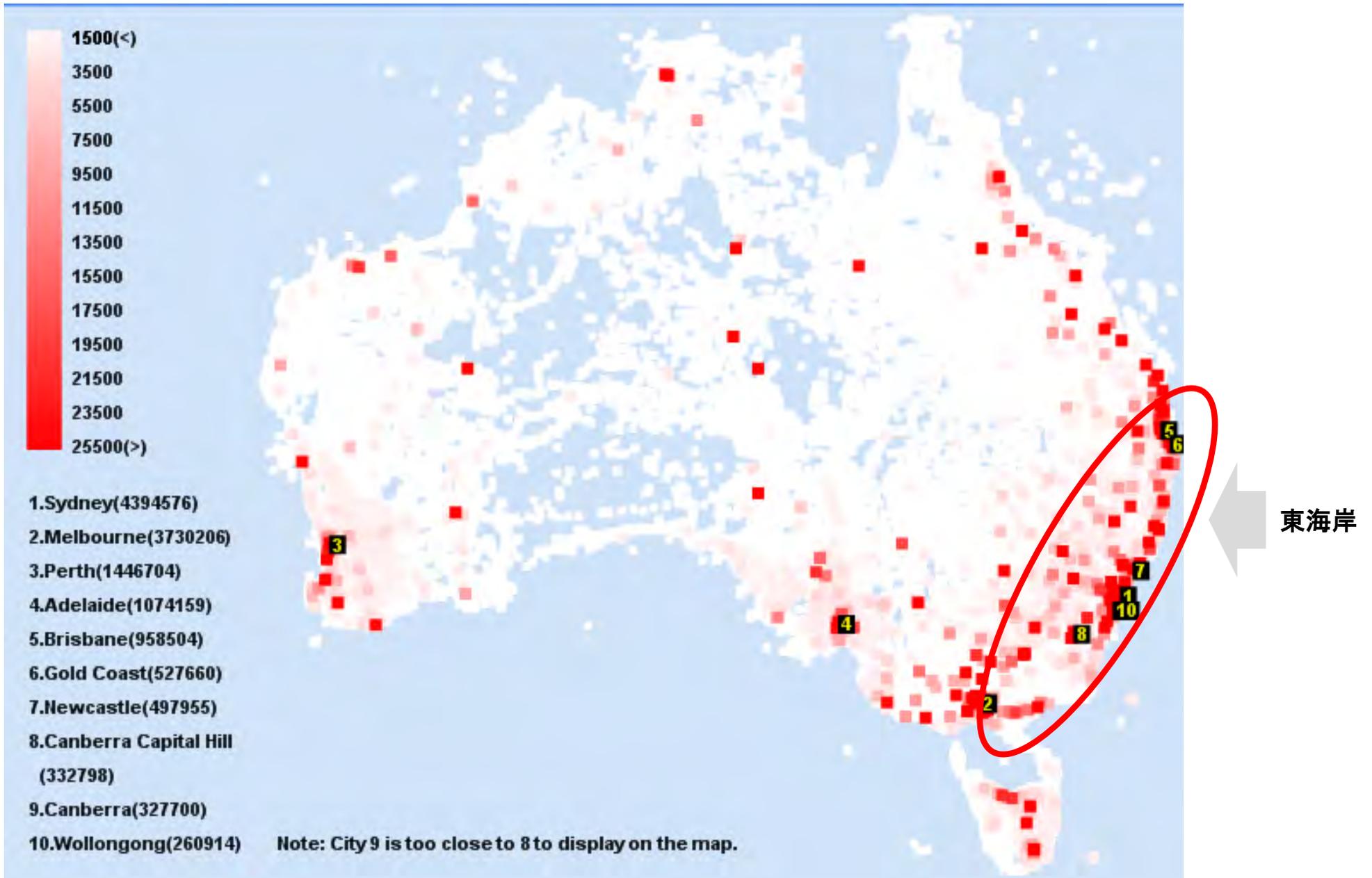
**日本**  
0.377百万km<sup>2</sup>  
127.3百万人  
GDP : 4.9兆USD/2013  
38,492USD/人

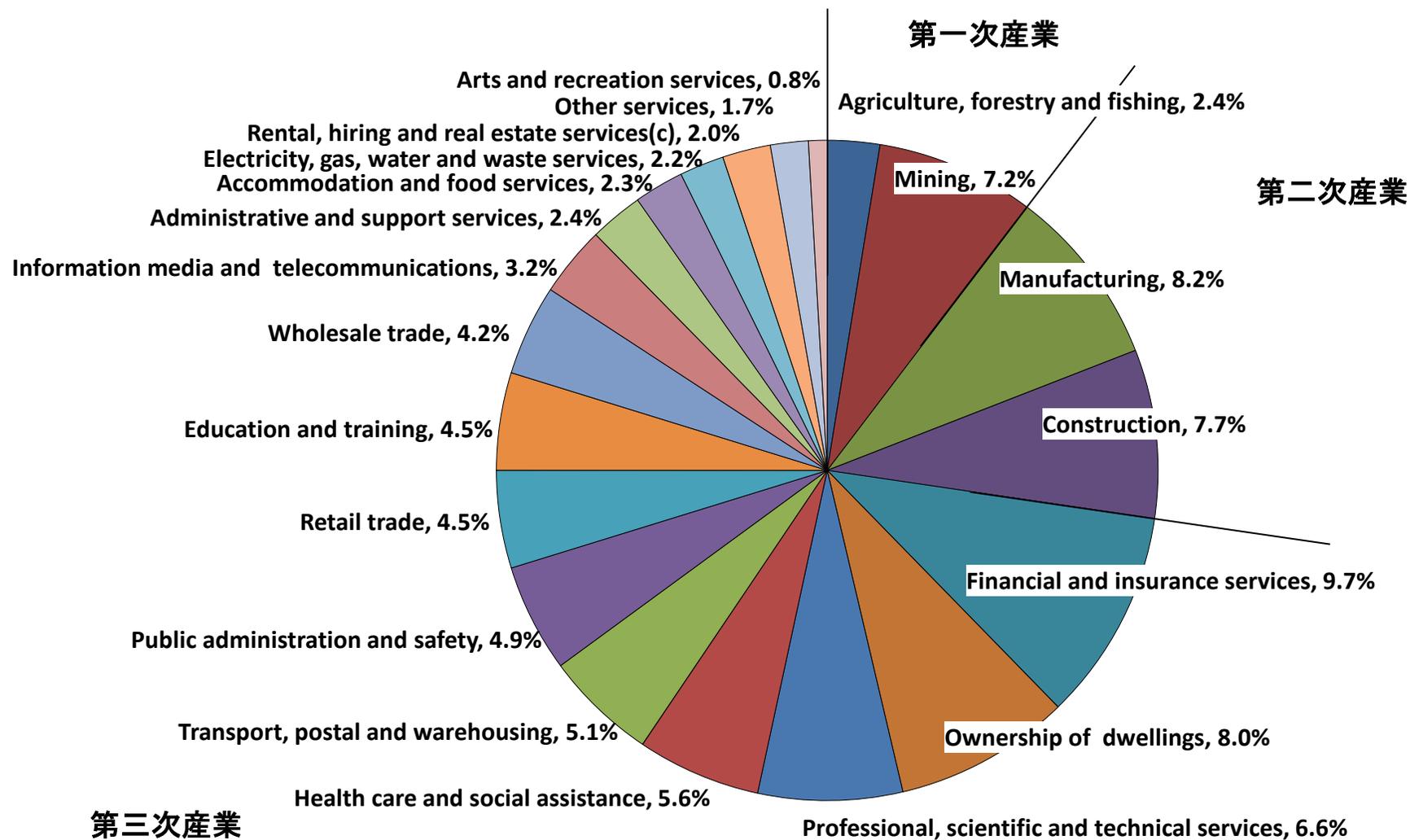
**Brisbane** 2.1百万人  
+11.2%/5年

**Sydney** 4.4百万人  
+8.1%/5年

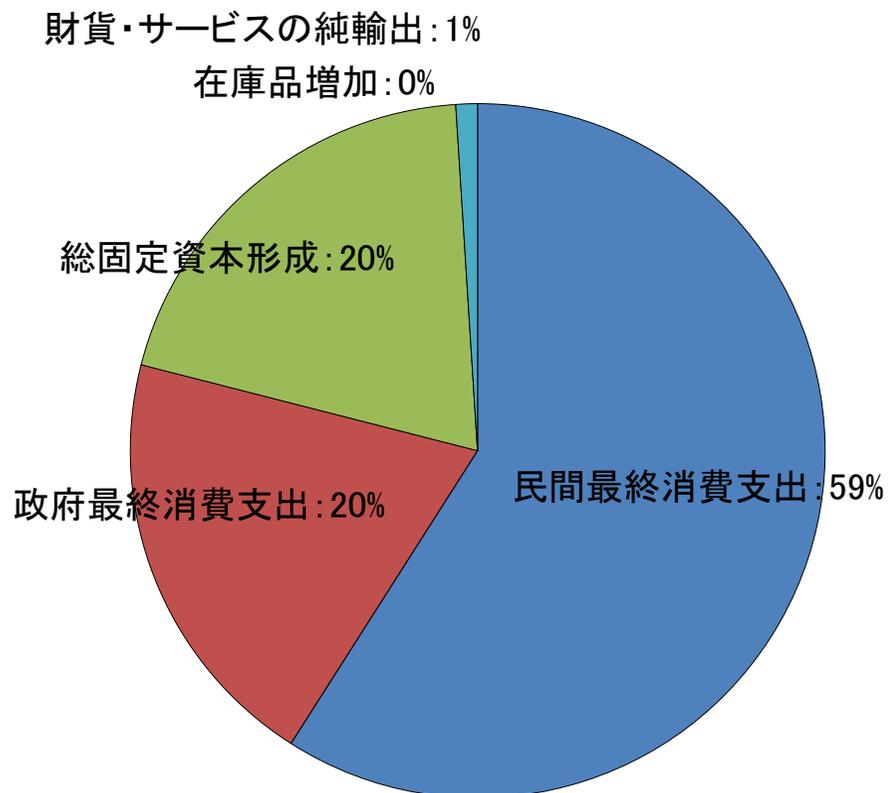
**Melbourne** 4.4百万人  
+10.4%/5年



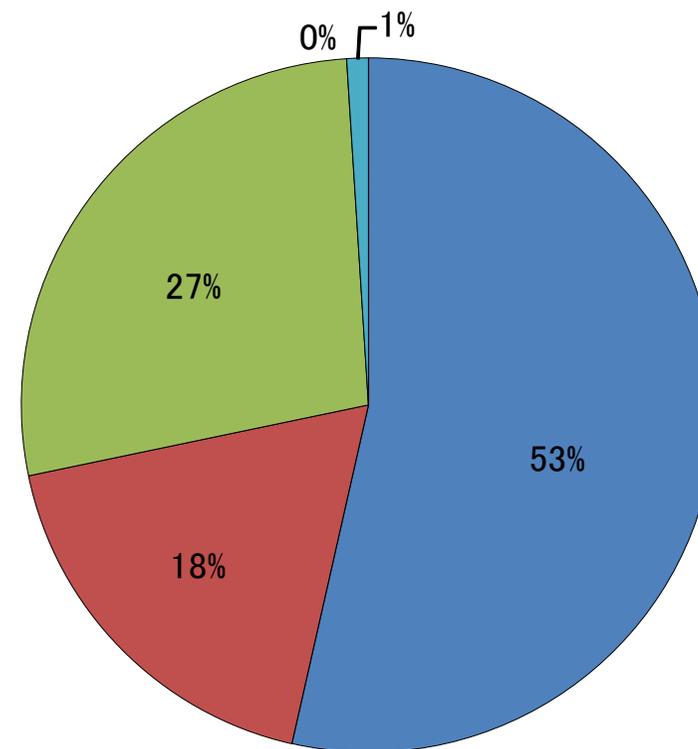




日本  
(481兆7,730億円)

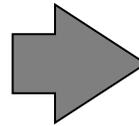


オーストラリア  
(1兆3,870億豪ドル)

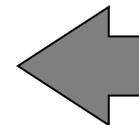
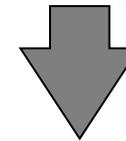


# キーワードは、“インキュベーター”

- + 独特で特徴的、かつ高効率な技術を保有  
(但し、ガラパゴス的技術も多く存在)
- 事業化に向けた実証等のための物理的な土地の確保が難しく、法規制が多い



- + アジアに広がる多様な気候区を自国内で有し、ナショナルリスクが極めて低い
- + 基礎技術の開発と蓄積、金融技術に長ける
- 優れた技術やアイデアの事業化が苦手



英語を基本プロトコルとするビジネスとして  
コンサバティブなオーストラリアの市場にて開発  
(IPや特許、契約形態、規格化)

i.e. AS/NZS ISO 31000:2009  
(replaces AS/NZS 4360:2004)

# オーストラリア北部開発とは

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# Developing Northern Australia

- On 28 February 2014 the Prime Minister announced the Australian Government will produce a White Paper on Developing Northern Australia that will set out a clear, well-defined and timely policy platform for future development in the north. A cross-agency Taskforce has been established in the Department of the Prime Minister and Cabinet to complete the White Paper within 12 months.



[Home](#) » [Media](#) » Northern Australia White Paper Underway

## NORTHERN AUSTRALIA WHITE PAPER UNDERWAY

28 February 2014

Prime Minister

Deputy Prime Minister

E&OE

The Premiers of Queensland and Western Australia and the Chief Minister of the Northern Territory have agreed to join a new Strategic Partnership to inform the development and implementation of Australia's first Northern Australia White Paper.



<https://www.pm.gov.au/media/2014-02-28/northern-australia-white-paper-underway-0>  
<https://northernaustralia.dpmc.gov.au/>

White Paper on Developing Northern Australia

Australian Government

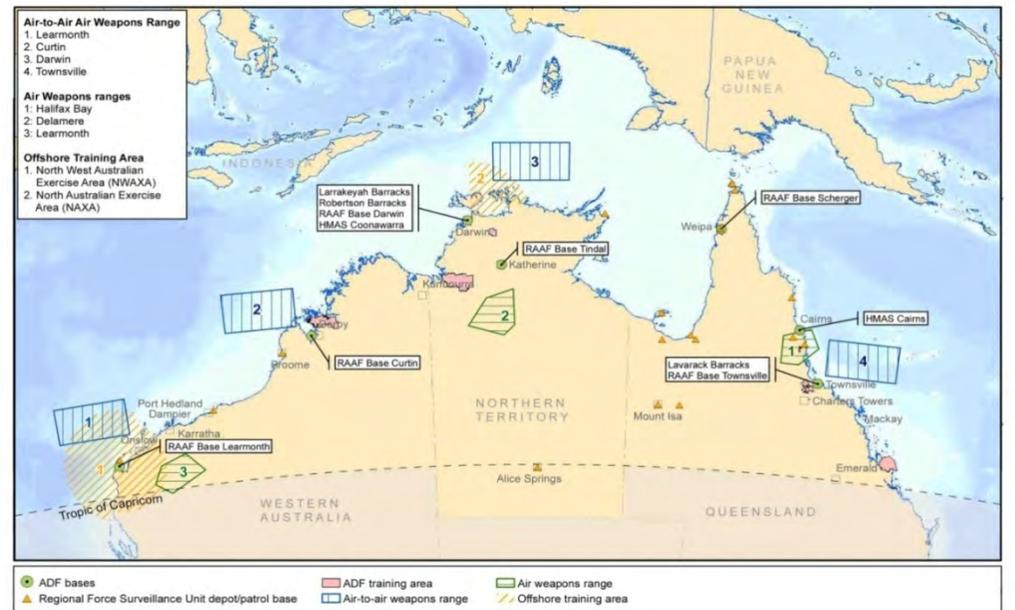
HOME > ABOUT

## About

The White Paper on Developing Northern Australia will be produced within 12 months. It will set out a clear, well-defined and timely policy platform for realising the full economic potential of the north, including a plan for implementing these policies over the next two, five, 10 and 20 years.

It will explore ways to capitalise on the region's strengths, provide the best regulatory and economic environment for business and identify critical infrastructure for long-term growth, public and private planning and investment.

A Strategic Partnership led by the Prime Minister, the Deputy Prime Minister, the Premiers of Queensland and Western Australia and the Chief Minister of the Northern Territory will help inform the development of the White Paper, supported by the Northern Australia Advisory Group.



# Business opportunities in Northern Australia

**Agriculture**

- Agribusiness Supply Chains
- Aquaculture Production
- Commercial Fishing Industry
- Forestry
- Horticultural Production
- The Tiwi Islands – Horticultural
- Ord Development Project (Stage 3) and Irrigated Agriculture
- Pastoral Production

**Energy**

- Onshore Exploration for Oil and Gas
- The Clarence Strait Tidal Energy Project & Tidal Test Centre

**Infrastructure**

- Pipelines
- Ports and Related Industrial Land
- Port of Darwin
- Railways

**Manufacturing**

- Biofuel Refining
- Downstream Processing of Minerals
- Downstream Processing of Natural Gas

**Property development**

- Development of Greenfield Residential Land Estates
- Farrar Precinct Residential and Commercial Land Development
- Berrimah Farm Residential and Commercial Land Development
- Zuccoli Greenfield Residential Land Development
- Industrial Land Estates
- Residential Dwelling Development
- Commercial and Retail Property
- Palmerston Regional Hospital
- Darwin's Marine Industry Park
- Holtze Residential and Commercial Land Development
- Darwin International Grammar School

**Mineral**

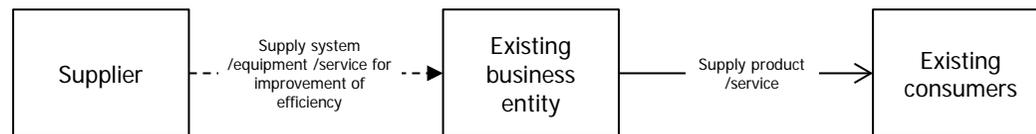
**Service industry**

- Mining Services and Supply
- Oil and Gas Services and Supply
- Capability Gaps in the Northern Territory Oil and Gas Sector

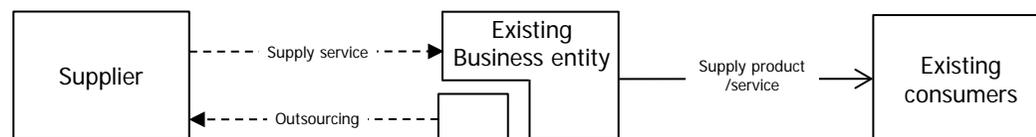
**Tourism**

- Darwin City Hotel Tourist Accommodation
- Luxury Hotel in Darwin
- Lee Point Urban Tourism Opportunity
- Finke Gorge Nature-based Tourism Accommodation
- Immersive Tourist Attractions in Parks

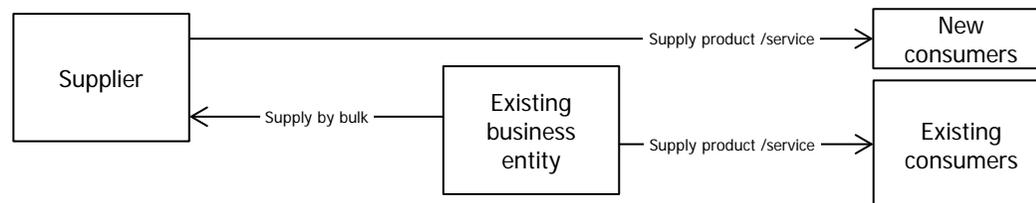
## Business scheme A



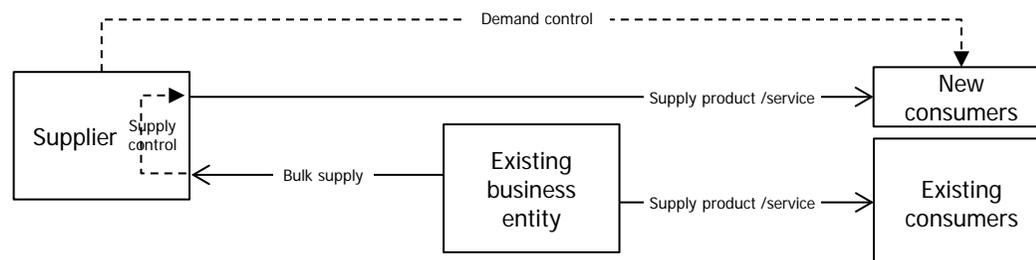
## Business scheme B

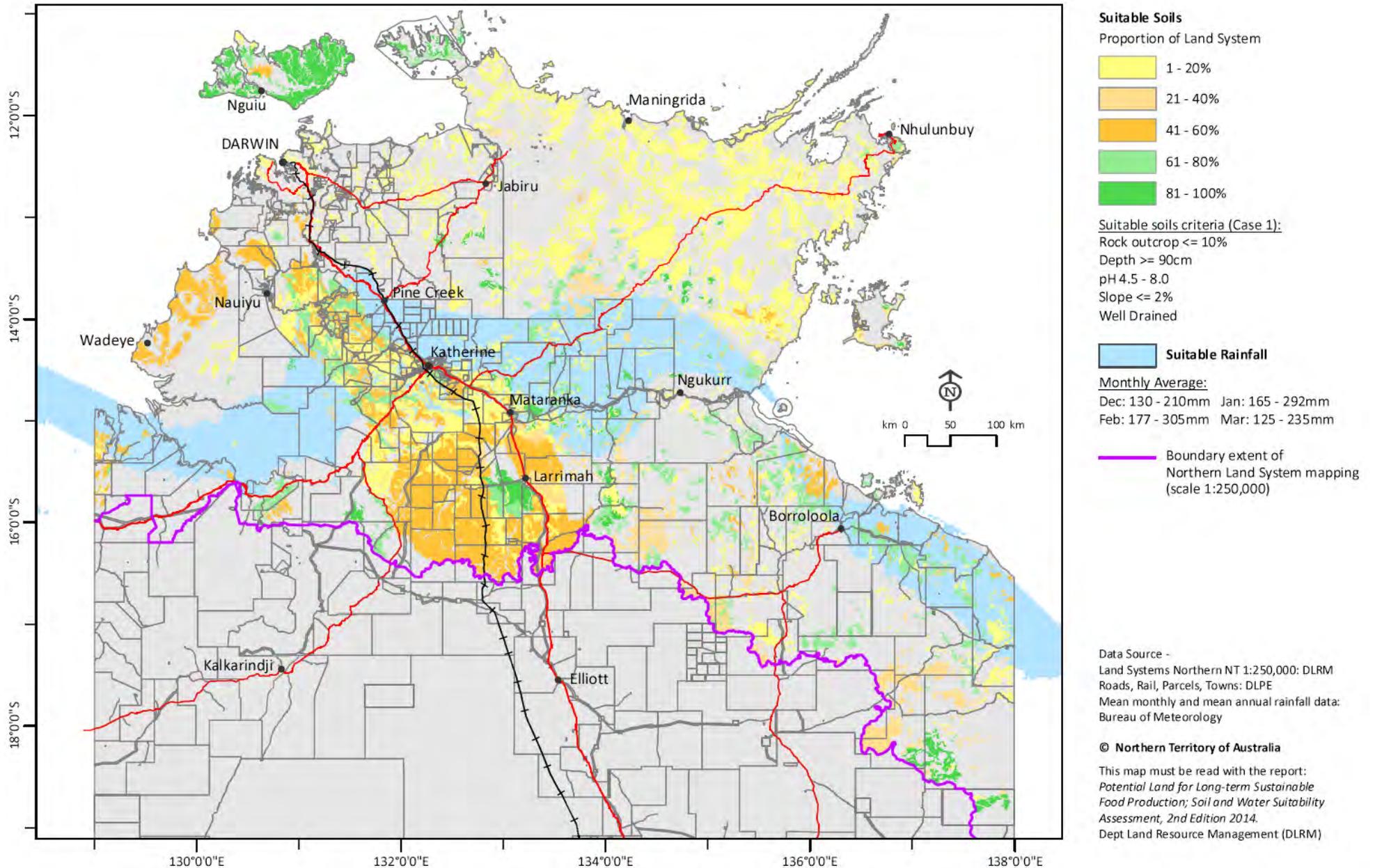


## Business scheme C



## Business scheme D





Department of State Development, Infrastructure and Planning

## Queensland bio-industries

Your biofuel and bio-based products business or investment can benefit from Queensland's mix of raw materials, expertise and business advantages.

The Queensland Government is here to help you address the critical parameters of your bio-industrial project. This brochure and map provide a snapshot of the opportunities and advantages of operating in Queensland.

Queensland has substantial resources and capabilities for sugarcane and other biomass research through a range of academic, government and industry centres.

### Global partnerships

Global companies currently collaborating on Queensland bio-industrial projects include:

- Amyris
- Boeing
- Dow
- Dupont
- LanzaTech
- Neste Oil
- Qantas
- Siemens
- Syngenta
- Virgin Australia
- Wilmar
- SkyNRG

### Fast facts

<b>Population</b>	4.5 million
<b>Size</b>	1.7 million km <sup>2</sup> /668,000 sq mi
<b>Gross State Product</b>	\$288.3 billion (2012-13)
<b>Projected economic growth</b>	3.6% for 2013-14 and 2014-15*
<b>Capital</b>	Brisbane
<b>Time zone</b>	UTC + 10
<b>International airports</b>	Brisbane, Cairns, Gold Coast, Townsville
<b>Government infrastructure spend</b>	\$16.5 billion (2012-2013)
<b>Primary exports</b>	Mining commodities, tourism, beef cattle, sugar, cotton and wheat
<b>Agricultural contribution to economy</b>	\$11.5 billion + \$3.2 billion in processing (2011-2012)
<b>Multi-faceted feedstock research including</b>	Sugarcane bagasse, woody biomass, oil seed crops, algae
<b>Climate</b>	30°C in summer and 20°C in winter
<b>Payroll tax</b>	4.75%, lowest rate in Australia

\* (Deloitte Access Economics Business Outlook - Dec 2013)

### International markets

Queensland, Australia is an eight hour flight from Tokyo, Japan and operates in a time zone within two hours of many major Asian major capital cities. This close proximity to Asian markets provides strong trading ties.

Queensland Government's Trade and Investment Office Network

Great state. Great opportunity.

## Feedstocks

**Sugarcane** is grown on 0.3 per cent of Queensland's land area and amounts to 94 per cent of Australia's sugarcane crop, 30 million tonnes valued at \$1 billion. Much of the bagasse is used for electricity generation in mills. Queensland produces 60 per cent of Australia's **sorghum** crop worth \$250 million.

**Additional feedstocks** include native grasses, crop stubble, eucalypts, acacia, mallee, cassava, agave, algae, pongamia and exotic pines.

Sugarcane  
**94% QLD**

Sorghum  
**61% QLD**

Current land use for sugarcane  
585,000 ha

Potential land use  
7,000,000 ha

### Bio-industry projects

There are six Queensland universities involved in bio-industrial product development. These institutions specialise in:

- sustainable aviation fuels
- enzymatic and thermo-chemical conversion technologies
- techno-economic modelling
- integrated supply-chain logistics
- harvesting and aggregation
- emerging specialised energy crops
- high yield cultivars
- germplasm improvement
- process optimisation

### Queensland's research and development projects include:

**Mackay Renewable Bio-commodities Pilot Plant** – The Queensland University of Technology (QUT) converts cellulosic biomass into bioethanol, biocrude and high value biocommodities.

**Tarong Algal Synthesiser Display Plant** – is a joint venture between MBD Energy, Stanwell Corporation and James Cook University investigating bioremediation of power station waste using algae to produce biocrude and animal feed.

**Solar Biofuels Research Centre** – University of Queensland's (UQ) Institute of Molecular Bioscience, the Queensland Government and industry partners collaborate on commercial production of microalgae-based biomass.

**ARC Centre of Excellence for Integrative Legume Research** – the centre researches native Australian pongamia pinnata legumes for human and animal food and sustainable biofuels.

### Commercial projects in Queensland

Project name	Company and website	Feedstock	Products	Proposed annual product volume	Location
AgriFuels	AgriFuels <a href="http://agrifuels.com.au">agrifuels.com.au</a>	Sorghum	Ethanol, Stockfeed	12 000 L/Ha 15 T grain/Ha	Isis Shire (near Bundaberg)
AustCane Energy	AustCane Energy Ltd <a href="http://austcane.com.au">austcane.com.au</a>	Sugarcane	Ethanol, Electricity	100 ML ethanol 49 MWH	Burdekin Shire (near Townsville)
BioEnergy Plantations	BioEnergy Plantations <a href="http://bioenergyplantations.com.au">bioenergyplantations.com.au</a>	Sugarcane	Bio diesel, Stockfeed	160 ML biodiesel	Eimbah and Spring Gully
Boeing-CSIRO Sustainable Aviation Fuel Project	Boeing, CSIRO and partners <a href="http://www.boeing.com.au">www.boeing.com.au</a>	Woody biomass (native regrowth)	Renewable jet fuel	500 ML jet fuel 2000 ML diesel	Fitzroy Basin (near Rockhampton)
Brisbane BioPort	Virgin Australia, Brisbane Airport Corp, SkyNRG <a href="http://virginaustralia.com">virginaustralia.com</a>	Various	Renewable jet fuel	5% of Virgin Australia's annual jet fuel demand	Various
Etheridge Integrated Agricultural Project	Integrated Food and Energy Developments <a href="http://i-fed.com.au">i-fed.com.au</a>	Sugarcane	Ethanol, Stockfeed	100 ML ethanol 346 000 MWH 400 000 T grain	Etheridge Shire (near Georgetown)
North Queensland Bio-Energy	NQBE Ltd <a href="http://nqbioenergy.com.au">nqbioenergy.com.au</a>	Sugarcane	Ethanol, Electricity	100 ML ethanol 85 MWH	Ingham (near Townsville)
RD Australia	RD Australia <a href="http://rdaust.com">rdaust.com</a>	Sugarcane	Ethanol, Stockfeed	100-1000 ML ethanol	Burdekin/Pentland (near Townsville)

**Feedstock legend:** Sorghum, Sugarcane, Pongamia Pinnata, Woody biomass (native regrowth), Guar bean

**Products legend:** Ethanol, Renewable diesel, Bio diesel, Renewable jet fuel, Electricity, Stockfeed

### Climate

Queensland's subtropical climate provides ideal conditions to produce strong yields with high quality products all year round.

Queensland's coastal rainfall totals for 2013 ranged from  
**600 mm to 3200 mm**  
 (24 inches to 125 inches)



“ Queensland's unique climate, diverse production locations, well-acclimatised varieties and production methods result in good yields and high quality products. ”

The Honourable John McVeigh, Minister for Agriculture, Fisheries and Forestry, Queensland Government.

### Land

Queensland has more than 20 million hectares of available growing land. The enclosed map provides details on current regional locations. The cultivation and management of sugarcane, forestry and other feedstocks is supported by large tracts of land and substantial areas of wood producing native and plantation forests.

View map for details

### Infrastructure

Queensland's thriving agricultural communities include seven regional towns with a shared population greater than 50 000 who are connected to international markets through world class infrastructure networks including:

**4** international airports **56** certified airports

**177 000** kilometre modern and efficient road network

**10 000** kilometre reliable and environmentally sustainable freight service rail network

**15** sea ports **7** bulk shipping terminals

Advanced sugarcane and forestry logistics  
**21** Raw sugar mills **75+** Wood processing facilities

**10** Universities

### Current commercial production

Industry leaders are exploring opportunities to establish commercial bio-refineries. Currently the state has three commercial bio-refineries and three traditional refineries:

#### Bio-refineries

**Sucrogen BioEthanol (Wilmar Sugar)** — Sucrogen is Australia's largest producer of sugar-based (molasses) ethanol and the third largest fuel-grade ethanol producer in Australia. The Sarina distillery is located south of Mackay and produces 60 million litres of ethanol per year.

**Dalby Bio-Refinery (United Petroleum)** — the Dalby facility is Australia's first grain to ethanol plant and produces 76 million litres of ethanol per year from red sorghum.

**Ecotech Biodiesel** — produce a FAME biodiesel from used cooking oil and tallow. The Brisbane facility can produce 30 million litres with capacity to increase production to 75 million litres.



#### Traditional refineries

**BP** — the Bulwer Island refinery supplies 16 megalitres (101 000 barrels) of fuel per day.

**Caltex** — the Lytton refinery supplies 18 megalitres (109 000 barrels) of fuel per day.

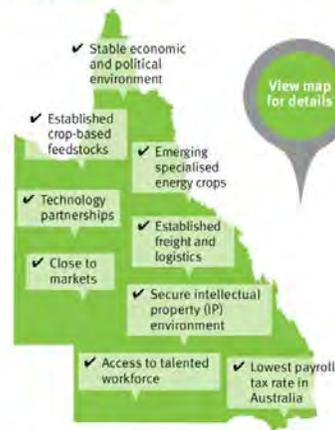
**Northern Oil Refinery** — this new 60 megalitre capacity lube-to-lube re-refinery in Gladstone processes used lubricant oil into base oil for reuse.

#### Other chemicals industry in Queensland:

**Minerals processing** — there are several large-scale base metal smelting and refining facilities mainly based at Queensland port towns.

**Chemicals manufacturing** — Orica and Inceitec Pivot operate three large production facilities, producing explosives, fertilisers and pesticides for local and international (or export) markets.

### Why Queensland?



View map for details

“ Virgin Australia is committed to developing a local sustainable supply of biofuel for use in our aircraft and we have set ourselves the target of 5 per cent renewable fuel use by 2020. ”

Geraldine Chin Moody, Group Executive - People, Culture and Sustainability, Virgin Australia

### Government facilitation

The government's Industry Case Managers are a 'one-stop-shop' for private investors. They work across government agencies to assist companies to obtain development approvals, reducing investment timeframes and costs.

We invite you to contact the Industry Case Managers to see how Queensland can assist your bio-industries company and major projects work.

Your single point of contact



### National annual sales of petroleum products in Australia (gigalitres-GL)

2012-2013	Queensland GL	Australia GL	QLD % of Aus.
Automotive gasoline	4.0	18.6	21.6%
Automotive diesel oil	6.9	22.6	30.5%
Aviation turbine fuel	1.6	7.8	20.6%
Liquid petroleum gas	0.6	3.8	14.9%
Others*	0.6	2.2	29.6%
<b>TOTAL</b>	<b>13.7</b>	<b>55.0</b>	<b>25.0%</b>

\*Includes bunker fuel, lubes, bitumen etc.

Source: Table 3C, Australian Petroleum Statistics, Issue 26: Bureau of Resources and Energy Economics, September, 2013



Queensland consumes almost **1/3** of Australia's annual diesel consumption

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## Etheridge Integrated Agricultural Project

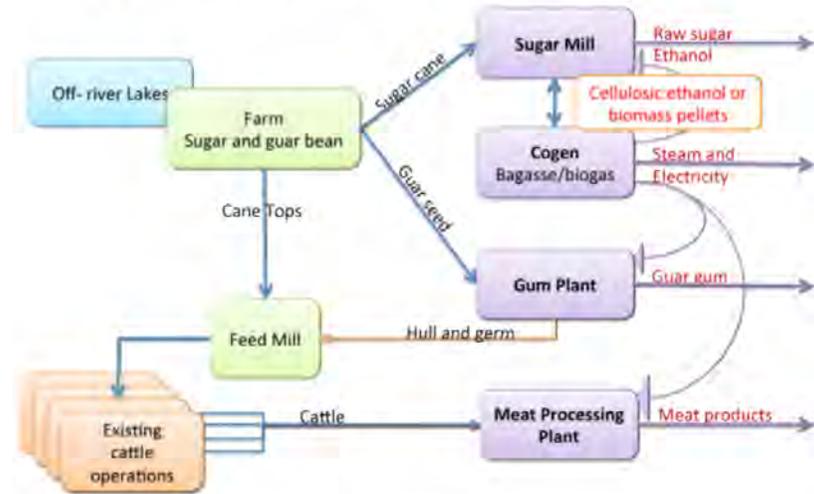
The Project was established to create a large scale integrated farm and processing precinct in the Gulf Savannah region of North Queensland. A Greenfield agricultural enterprise comprising 50,000 hectares of irrigated cropping land, co-located processing facilities and associated water, electricity and logistics infrastructure will be established.



Sugar cane - already widely grown in Queensland and guar bean - a leguminous crop suited to rotation with sugar cane - will be cropped and processed.

Guar bean is used to produce a natural colloid used in food manufacture and, more recently, coal seam fracking. Increasing demand for gluten free food which requires alternative food additives like guar gum and the very rapid growth in coal seam gas is leading to insufficient supply. The project is well positioned to meet local requirements for guar gum close to one of the world's hotspots for coal seam methane.

The integrated enterprise includes on-farm and off-farm water storage and water distribution, farm and cattle grazing operations, factories, power station and other infrastructure.



*Integration enables all parts of the project to be optimized.*

Sustainability and environmental management can be delivered as a central element of the enterprise. New Farming technologies can be implemented to reduce impacts and increase productivity.

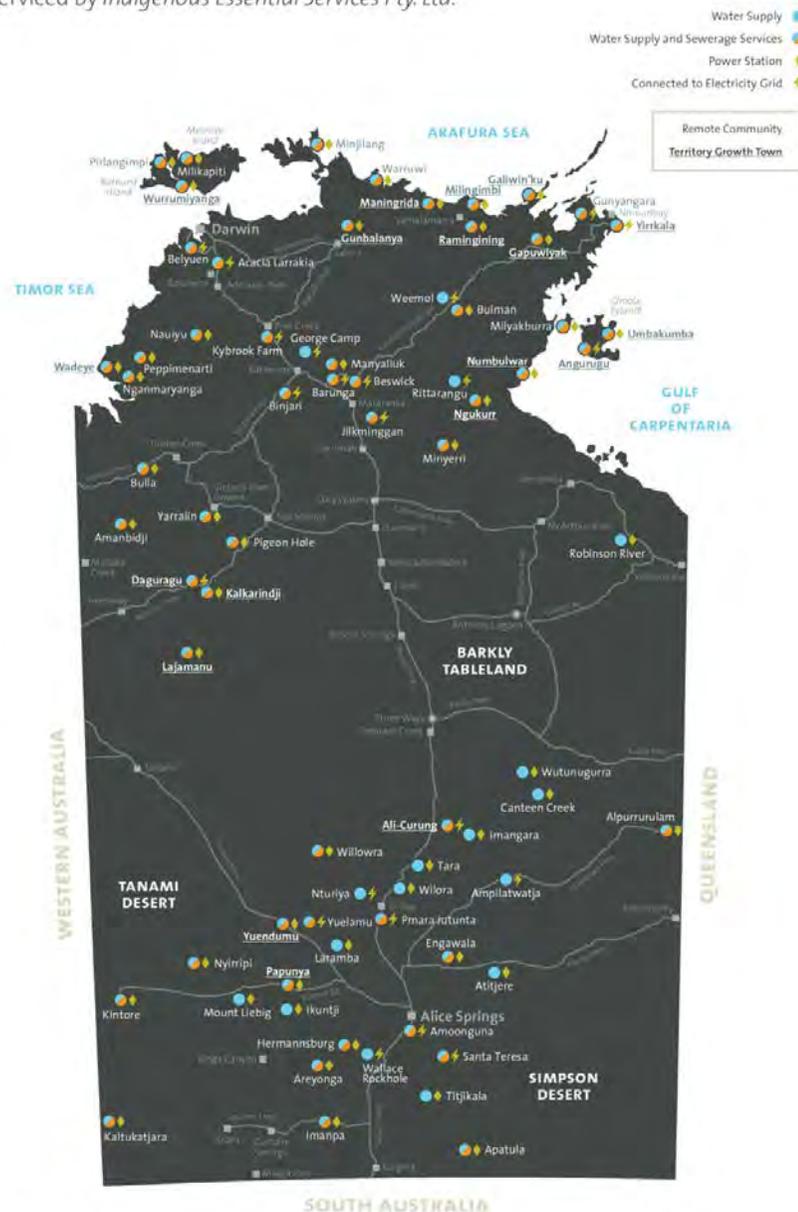
By-products from farming such as green tops and trash can be used as stock feed when blended with protein by-product from the guar gum plant.

Process water will be recycled as irrigation water returning nutrient back to the farm. The carbon footprint of the enterprise can be minimized. A co-located cattle back-grounding facility enables nutrient-rich manure to be collected and reused in farming operations thereby decreasing artificial fertilizer application. Farm run-off during heavy rain events can be managed across the entire farm to capture sediment and overland flows which will be recycled and used on-farm.

Liquid waste from the processing facilities will be treated in a biogas plant. Biogas will provide additional energy for the cogeneration plant to dry sugar and gum products.

Regional cattle producers bear substantial live cattle transport costs and carcass shrink losses resulting in significantly reduced net returns. In some cases, cattle are left to die on the property rather than transported at a loss for slaughter. Over one million cattle are exported from the region. Processing of marginal cattle from the region will exploit a wasted regional resource.

## Territory Growth Towns and Remote Communities serviced by Indigenous Essential Services Pty. Ltd.



Additional information below

(533) POPULATION

CONNECTED TO ELECTRICITY GRID

DIESEL POWER STATION

SOLAR, DIESEL, HYBRID POWER STATION

Remote Community

**Territory Growth Town**

### NORTHERN REGION

**Acacia Larrakeya (90)** ⚡

- Perennial groundwater source available, which is continuously monitored.
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 137 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Angurugu (883)** ⚡

- Perennial groundwater source, which is continuously monitored and extraction licence is pending. Also a plentiful surface water source available, which is licensed.
- Good quality water, treated with sodium, disinfected with gas chlorine and monitored weekly for microbes.
- Township water demand of 83 U/EPD.
- Secondary sewage treatment, which discharges to irrigation area.

**Beluere (209)** ⚡

- Perennial groundwater source available, which is continuously monitored and extraction licence is pending.
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 143 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Caliwinku (2,101)** ⚡

- Perennial groundwater available.
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 138 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Gapuwiyak (1,057)** ⚡

- Limited groundwater source available, which is continuously monitored.
- Very good quality water, disinfected with sodium hypochlorite and monitored weekly for microbes.
- Township water demand of 14 U/EPD.
- Secondary sewage treatment, which discharges to irrigation area.

**Gunbalanya (1,094)** ⚡

- Limited groundwater source available, which is continuously monitored. Also limited surface water source available and extraction licence is pending.
- Good quality water, disinfected with sodium hypochlorite and ultraviolet and monitored weekly for microbes.
- Township water demand of 82 U/EPD and efficiency program started.
- Secondary sewage treatment, which discharges to the environment.

**Maningrida (2,463)** ⚡

- Perennial groundwater source available, which is continuously monitored.
- Very good quality water, disinfected with sodium hypochlorite and ultraviolet and monitored weekly for microbes.
- Township water demand of 140 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Milikapiti (454)** ⚡

- Perennial groundwater source available, which is continuously monitored.
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 137 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Milingimbi (1,108)** ⚡

- Very limited groundwater source available, which is continuously monitored.
- Very good quality water, disinfected with sodium hypochlorite and monitored weekly for microbes.
- Township water demand of 69 U/EPD and conservation education program started.
- Secondary sewage treatment, which discharges to the environment.

**Milyakourra (133)** ⚡

- Perennial groundwater source available, which is continuously monitored.
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Secondary sewage treatment, which discharges to the environment.

**Minjilang (323)** ⚡

- Perennial groundwater available.
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 138 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Nauyiu (474)** ⚡

- Perennial groundwater source available, which is continuously monitored and extraction licence is pending.
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 82 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Nganmalyanga (Faluropa) (402)** ⚡

- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 29 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Numbulwar (843)** ⚡

- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 24 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Peppinarti (215)** ⚡

- Perennial groundwater source available.
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 140 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Pirdangimpi (442)** ⚡

- Perennial surface water source available and extraction licence is pending.
- Very good quality water, filtered through sand, disinfected with sodium hypochlorite and ultraviolet and monitored weekly for microbes.
- Township water demand of 37 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Ramingining (804)** ⚡

- Perennial groundwater source available and continuously monitored.
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 29 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Umbakumba (424)** ⚡

- Diesel power station.
- Limited groundwater source available, which is continuously monitored.
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 139 U/EPD.
- Secondary sewage treatment, which discharges to irrigation area.

**Wadeye (2,028)** ⚡

- Perennial groundwater source available, which is continuously monitored and extraction licence is pending.
- Very good quality water, disinfected with gas chlorine, fluoride added and monitored weekly for microbes.
- Township water demand of 23 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Warlaw (436)** ⚡

- Limited groundwater source available, which is continuously monitored.
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 82 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Wurruyiyanga (Nguiu) (1,577)** ⚡

- Perennial groundwater source available, which is continuously monitored.
- Good quality water, disinfected with gas chlorine, fluoride added and monitored weekly for microbes.
- Township water demand of 90 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Yirkala (850)** ⚡

- Perennial groundwater source available and extraction licence pending.
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 110 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Yulkalindi (406)** ⚡

- Limited groundwater source available and extraction licence pending.
- Good quality water, disinfected with gas chlorine and monitored monthly for microbes.
- Township water demand of 10 U/EPD.
- Secondary sewage treatment, which discharges through excretion.

**Amambidji (91)** ⚡

- Limited groundwater source available.
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 32 U/EPD.
- Secondary sewage treatment, which discharges to irrigation area.

**Barunga (335)** ⚡

- Surface water source monitored by DWAFS and licensed.
- Good quality water, filtered through cartridge system, disinfected with sodium hypochlorite and ultraviolet and monitored monthly for microbes.
- Township water demand of 99 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Beswick (465)** ⚡

- Perennial groundwater source available, which is continuously monitored and extraction licence pending.
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 106 U/EPD, efficiency awareness program in place.
- Secondary sewage treatment, which discharges to irrigation area.

**Binjari (230)** ⚡

- Limited groundwater source available and extraction licence pending.
- Good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 49 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Bulla (128)** ⚡

- Limited groundwater source available.
- Limited surface water source, available and extraction licence pending.
- Marginal quality water, filtered through sand, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 62 U/EPD.
- Secondary sewage treatment, which discharges to irrigation area.

**Bulman (300)** ⚡

- Perennial groundwater source available and extraction licence pending.
- Good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 109 U/EPD.
- Secondary sewage treatment, which discharges to the environment.

**Dagarrgu (270)** ⚡

- Connected to Callaburra electricity grid.
- Limited groundwater source available.
- Good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 109 U/EPD.
- Secondary sewage treatment, which discharges through excretion.

**Jilkminggan (330)** ⚡

- Perennial groundwater source available and extraction licence pending.
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 44 U/EPD.
- Secondary sewage treatment, which discharges to irrigation area.

### KATHERINE REGION

**Kalkarindji (406)** ⚡

- Limited groundwater source available and extraction licence pending.
- Good quality water, disinfected with gas chlorine and monitored monthly for microbes.
- Township water demand of 10 U/EPD.
- Secondary sewage treatment, which discharges through excretion.

**Nyirripi (74)** ⚡

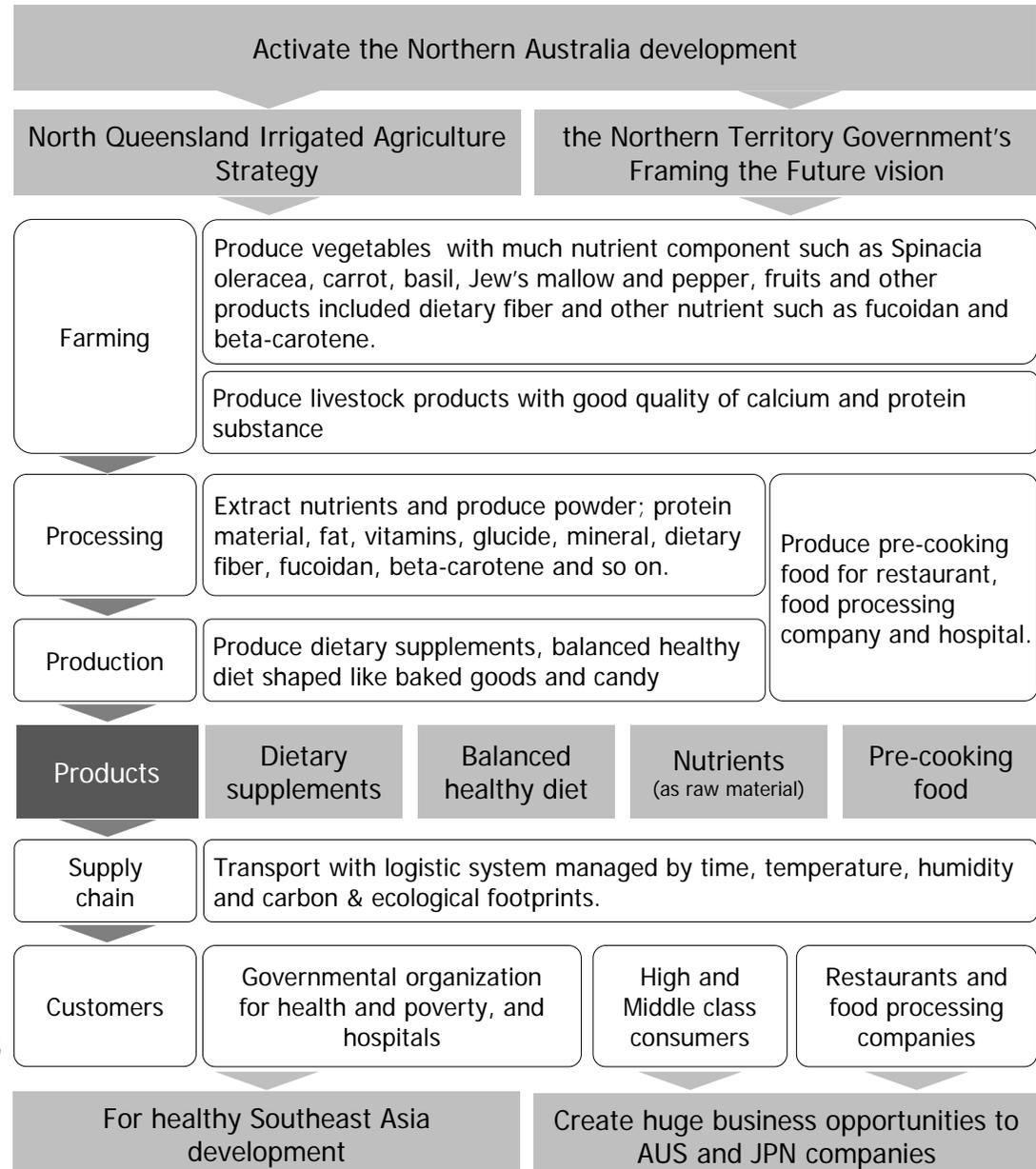
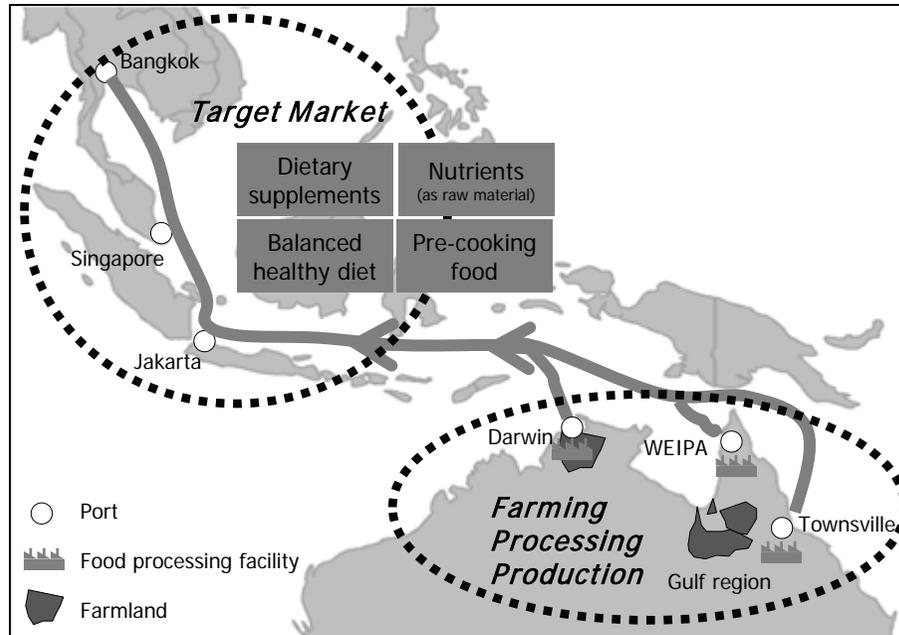
- Connected to Katherine electricity grid.
- Limited groundwater source available and extraction licence pending.
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes.
- Township water demand of 4 U/EPD.
- Secondary sewage treatment, which discharges to irrigation area.

# 持続可能な食品製造及びエネルギー供給事業とは

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# A project to support health growth of Asia from table

- NRI believes that comfort eating in Southeast Asia contributes to health improvement and regional prosperity in Asia-Oceania region.
- In Australia, development of the Northern region is underway, with a focus on agriculture.
- With the domestic market expected to shrink gradually, Japanese companies including logistic and retail industry are aggressively setting up shop in Southeast Asia.
- We trust that stable supply of nutrients of vegetable origin from Australia, rather than chemical origin, would create and provide huge opportunity to both AUS and JPN companies.
- NRI would like to pursue this concept and put into practice.



# エネルギー作物の栽培と分散型・持続可能エネルギー供給事業

## ■ 提案の概要

- インドネシアやタイといった拡大市場に近く、近年、連邦政府を中心とした開発が進み、電力グリッドの未成熟なオーストラリア北部地域において、エネルギー作物の栽培とそれらを活用した分散型エネルギー供給システムを、日本の技術を活用して、展開する。

## ■ 提案の背景

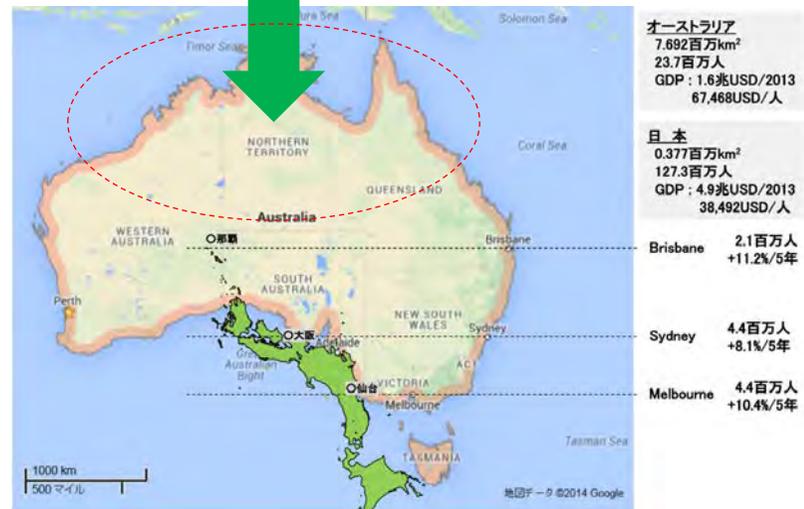
- オーストラリア北部地域は、アジアに最も近いオーストラリアのエリアとしての特徴を活かすべく、近年、連邦政府及び北部準州、クィーンズランド州、西オーストラリア州の各州がその開発に力を入れている。
- 開発は特に、農業、エネルギー、ツーリズムに関連する分野に力点が置かれており、貿易に立脚した経済圏の確立を目的として進められている。
- 日本は近年、経済産業省を主要な政府機関として、インフラ輸出に力を入れており、エネルギー消費や環境への影響を低減しつつ、優れた機能を提供する日本のインフラ・システムは、地球規模での気候変動の緩和にも貢献する潜在能力を有している。
- オーストラリア北部地域は、アジアに最も近いという特性から、例えば、キャッサバのバイオディーゼル化により農地が著しく疲弊しているタイなどへの輸出など、インフラシステムそのものの輸出を含め、持続可能なエネルギー供給に係るインフラシステムは、ビジネスチャンスとして、高い可能性を有していると言える。

## ■ 事業の規模

- 最終的には、農地800~1,000ha程度の規模を想定。
- テストマーケティング時には、農地20ha程度を想定。

## ■ 食糧との競合に係る課題への対応方策

- 近年、バイオ燃料には、持続性可能基準の遵守が国際的に求められているところであり、食糧生産が可能な地域でのエネルギー作物の栽培には一定の配慮が必要となる可能性がある。
- 本来であれば、食糧生産の残渣を効率的にエネルギー源として使用する方が、より持続可能であるという指摘もあり、また、栽培する農産物が食糧で、かつ、付加価値の高いものが生産できれば、事業全体で優れた経済性を得る可能性も出てくる。
- このことから、食糧との競合に係る課題に対処するため、農産物の生産を主として、残渣等を有効に活用するシステムの検討が必要となることも考えられる。
- この地域に近接するアジアの国々では、安心安全な食糧の調達についても重要な課題となっており、食糧とエネルギーの双方の供給が行えるシステムの開発は、より現実的な事業性に結びつく可能性もある。
- このことから、事業性の評価においては、分散型持続可能エネルギー供給システム単体とするのではなく、食糧生産をも考慮することが考えられる。



## ■ 事業パッケージの案

- 日本の企業等のインフラ輸出を対象としていることから、現状では次の技術群のパッケージを検討している。
  - ICT技術を活用し、農研機構が開発した土壤微生物の多様性/活性分析を、日本とオーストラリア北部間でシームレスに行うプラットフォーム
  - エネルギー作物として高収率な高成長ソルガムの種及び栽培システム
  - バイオエタノールやバイオディーゼル、バイオガスの生産技術
  - コジェネ等を活用した分散型エネルギー供給システム