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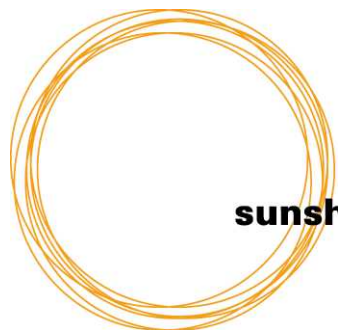
Sunshine Electricity Joint Venture Co-generation Project



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Issues & opportunities

- Need to replace obsolete boilers (esp' Condong)
- High capital cost of boiler plant
- Limited availability of capital funding
- Potential crop expansion at Broadwater Limited
crop expansion potential at Condong
- Need to reduce field burning of cane
- Income diversification and industry security
- Mandated Renewable Energy Target (MRET).



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Condong Boiler Plant

Number of boilers	Date of manufacture	Type	Steam conditions	Approx max steam output
2 off	1960	Fire-tube (Sargeants) with pyramid grate	1050 kPag (saturated)	2 x 5 t/h
3 off	1925	Fire-tube (Thompson Castlemaine) with pyramid grate	560 kPag (saturated)	3 x 4 t/h
1 off	1951	Fire-tube (Babcock & Wilcox) with pyramid grate	560 kPag (saturated)	4 t/h
2 off	1912	Water-tube (Stirling) with CSR stepped louvre, rocking grate	1050 kPag (saturated)	2 x 7 t/h
1 off	1965	Beta (John Thompson Australia) suspension-fired with pinhole grate (since 1988)	1750 kPag and 280 C	60 t/h



Condong Boiler Limitations

- Stack emissions
- Low thermal efficiency
- High maintenance costs
- 8 of 9 were very small with basic grates – intolerant of poor fuel
- High operational labour costs
- Occupational health and safety hazards
- Limited bagasse storage capacity
- Unsuitable steam conditions



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Broadwater Boiler Plant

Number of boilers	Date of manufacture	Type	Steam conditions	Approx max steam output
1 off	1965	Beta (John Thompson Australia) suspension-fired with pinhole grate (since 1988)	1750 kPag and 280 C	70 t/h
1 off	1995	ABB – VU-40 Two Drum, natural circulation water tube boiler C/W integral water cooled furnace, air heater and flue gas scrubber.	4500 kPag and 450 C	50 t/h



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Broadwater Boiler Limitations

- Need for increased capacity to accommodate a forecast increase in crushing rate and cane crop
- Unsustainably high wear rate around the gas pass baffles in the Thompson Beta boiler
- Stack emissions



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The initial concept

- Replacing existing boilers and turbines
 - *30MW at Condong*
 - *30MW at Broadwater, retain 8MW set (45 bar, 450C)*
- Green cane harvesting
- Bagasse, trash and some wood as fuel
- Year round operation – 420GWh per annum
- High efficiency
- Joint Venture



Project history

- Original request for EPC tenders - May 2000
- Condong development consent December - 2000
- Joint Venture formally formed in - 2001
- Broadwater development consent January - 2003
- Broadwater appeal dismissed November - 2003
- Financial close April / May - 2005



Development Process

October 1998	Pre-feasibility studies
May 1999	Memorandum of Understanding
July 1999	Feasibility study
April 2000	Preparation of initial technical specifications
October 1999	Call for EoI from design/construction contractors
April – July 2000	Initial tendering process
March 2000	Preparation of SEE submission of Development Application (for Condong)
December 2000	Development Approval - Condong
December 2000	Development of prototype trash separation plant



Development Process

April 2001	RE Act passed through Federal Government
September 2001	Finalisation of Joint Venture Agreement
February 2002	Preparation of EIS & submission of DA (for Bwr)
December 2002	Initial Development Approval - Broadwater
November 2003	Final Development Approval – Broadwater
Nov 2003	Re-tendered EPC works
October 2004	Limited Notice to Proceed (LNTP) issued
May 2005	Due diligence, agreements & finance concluded. Final NTP issued to EPC Contractor



Development Process

October 2006	Decision to mill “whole cane”
14 Dec 2007	Date of first synchronisation - Condong
25 Feb 2008	Date of first synchronisation – Broadwater
6 June 2007	Contract date for practical completion - Condong
21 August 2007	Contract date for practical completion - Broadwater
1 October 2008	Actual date for practical completion - Condong
21 November 2008	Actual date for practical completion - Broadwater



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Environmental Studies, eg Bwr

- Air Quality Impact Assessment
- Receiving Waters Impact Assessment
- Thermal Impact Assessment
- Aquatic Ecology Impact Assessment
- Groundwater Impact Assessment
- Noise Impact Assessment
- Flora and Fauna Assessment
- Archaeological Survey and Assessment
- Social and Economic Assessment
- Traffic Impact Assessment
- Preliminary Hazard Assessment



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Who is Sunshine Electricity?



Sunshine Renewable Energy Pt
Ltd

Delta Electricity Australia Pty Ltd

Joint Venture Steering Committee

Sunshine Electricity Management Pty L

Project Team



Who will do what?

NSWSMC

Operations & Maintenance
Fuel purchasing and management
Bagasse supply
Steam & electricity user

DELTA

PPA offtake
REC marketing
Asset management

The project's economics and viability are enhanced by the skill sets within the Joint Venturers



“Internal” Agreements

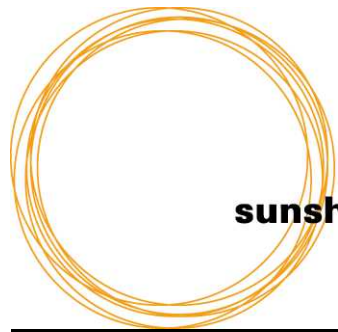
- Joint Venture
- Power purchase
- Energy transfer
- Asset management
- Operations and maintenance (O&M)
- Site leases
- Site capital works



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“External” Agreements

- Finance agreements
- EPC (Engineering, Procurement, Construction) contract with DES/CBH consortium
- Condong water supply – treated effluent
- Condong switching station
- Property / airspace / riverbank / water leases
- Network Connection agreements
- Independent Technical Expert
- Project manager / contract superintendent



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Finance

- Consortium of banks
 - CBA
 - ABN AMRO
 - Royal Bank of Scotland
- Non recourse project financed
- Total construction cost about \$180M (Two turnkey plants, Condong switchyard, Additional Site Capital Works at each mill)



Design Parameters

Steam conditions	7100 kPag, 520 °C
Boiler MCR	152 t/h
Boiler efficiency (on bagasse)	72%
Turbine	Siemens SST-300 extraction/condensing IP bleed: 1800 kPag, 280 °C, 36 t/h LP extraction: 150 kPag, 130 °C, 54 t/h
Generator	ABB Brushless Synchronous Generator 11kV, 37.5 MVA, air-cooled
Condenser cooling medium	Condong – Cooling Tower using TE from Murwillumbah STP Broadwater – water from Richmond River
Boiler water treatment	Reverse osmosis and deionisation



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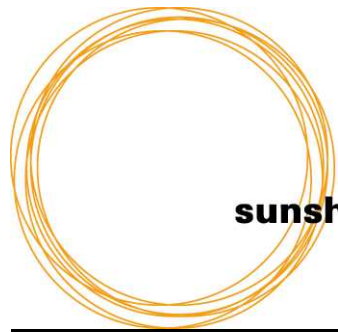
Scope of Work – EPC Contract

- Boiler and its associated auxiliary plant
- Steam turbine generator and its auxiliary plant
- Fuel handling plant,
- In-line storage bin and stockpile area (Cdg only)
- Water treatment plant
- Cooling tower (Cdg only)
- Civil works including roads
- Electrical installations including 415 V, 3.3 kV and 11 kV systems, 11/66 kV transformer
- Control system.



Scope of Work – Other

- Demolition & relocation of some mill plant
- Broadwater stockpile
- Feeding Station modifications
- Crushing Station modifications (incl' electric mill drives at Cdg)
- Process modifications
- Electrical Interconnection at Condong
- Water Supply



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EPC Contract

- Performance-based specification - clear set of project objectives.
- Minimum technical standards.
- AS 2124 with changes re' security, insurance and guarantees.
- Performance guarantee schedules.
- Detailed design - responsibility of contractor



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Fuel Supply

- Sources

- Bagasse from milling operations
- Trash previously burned in the field -ash implications
- Supplementary wood – sawmill refuse, camphor laurel

- Logistics

- Green cane harvest to collect trash - no infield burning
- Milling of trash with cane - solved ash issues
- Collection and delivery of wood - availability and cost



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“Highlights!!”

- Land & Environment Court experience
- Project Finance
- Impact of national electricity rules
- Construction
- Commissioning



Lessons

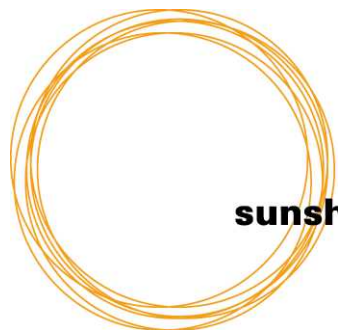
- Choose your partner carefully – NSWSMC & Delta a good match
- Dedicate staff to the project and have them allocated consistently through different stages of the project
- Need for detailed environmental impact assessments and rigorous consultation with all stakeholders.
- Timing, eg development approval before contract tendering, earlier involvement of lenders
- High overheads associated with project finance
- Very challenging!!



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Do not

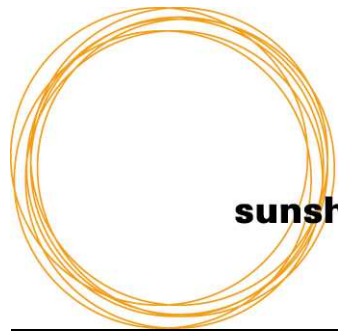
- **Be ambitious in allocating time for each stage of the project**
- **Underestimate the interference a project development will have on your core business**
- **Underestimate the effort required to achieve non-technical milestones**



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Condong

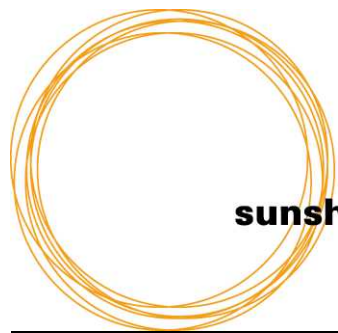




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Condong

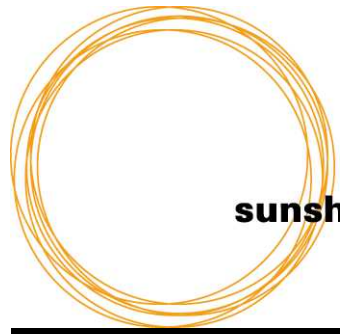




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Condong

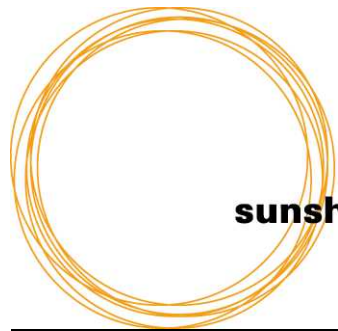




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Broadwater

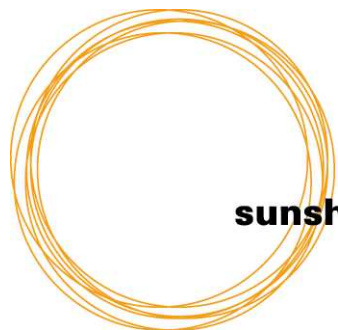




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Broadwater





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Broadwater

