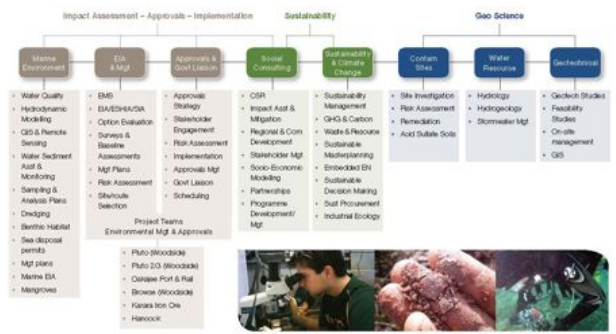


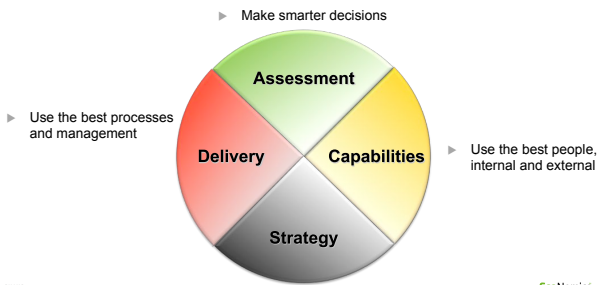
EcoNomics™ Sustainable Project Delivery

Nick Houldsworth - Environment & Sustainability Manager



EcoNomics™ Delivering profitable sustainability

Our approach to delivering sustainable and profitable projects for our customers

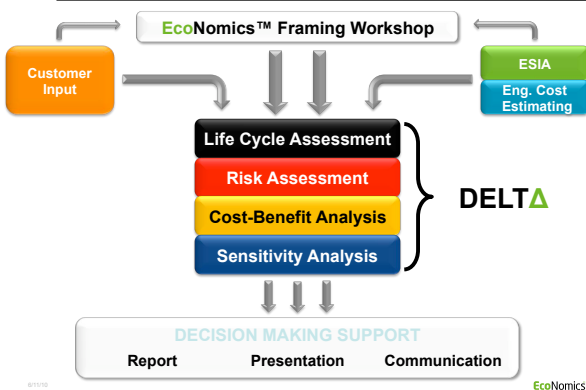


ΔELTA© Assessment

ΔELTA© is part of the suite of EcoNomics™ services and technologies that WorleyParsons is using to change the culture of engineering and project delivery.

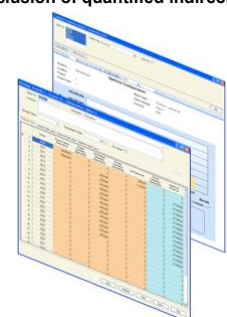
Applies cost-benefit analysis to determine the most economical options over operational life.

- Determine the most sustainable options
- Examine the economic implications of alternatives
- Quantify direct and indirect sustainability factors in hard monetary terms
- Removing the subjectivity
- Reducing risk by quantifying direct and external costs & benefits over the long term
- Providing a single consistent metric



DELTA allows traditional financial assessment or full social-economic assessment with the inclusion of quantified indirect considerations.

- ▶ Financial (conventional)
 - IRR
 - Payback
 - NPV
- ▶ Full Social-Economic
 - External benefits
 - External costs / dis-benefits
 - Monetisation of risks / damage
- ▶ Sensitivity Analysis
 - Energy and fuel price trajectories
 - External cost and benefit valuations
 - GHG cost trajectories

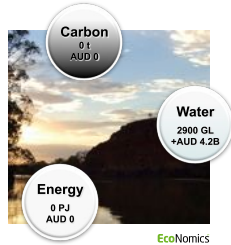


Project: Greater Adelaide Water Supply and Management Strategy
Customer: Office of Water Security, South Australian Government

- ▶ Current water sources not sufficient to meet demand in Adelaide beyond 2013. Climate change expected to further reduce security of supply.
- ▶ EcoNomics™ Assessment to identify the most economic and sustainable sequencing of solutions for managing potable water supply to Adelaide to 2050.
- ▶ Options considered included demand management, wastewater and stormwater harvesting and recycling, water purchase and desalination.
- ▶ Considered likely changes in policy, security of supply, marine and GHG impacts and energy costs over project life.

AUD \$2.0 B in NPV benefits identified

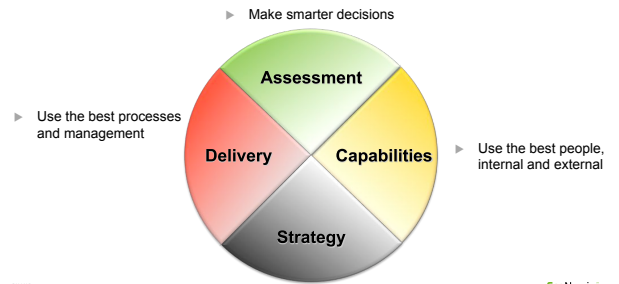
*Optimum option vs BAU (3.5% discount rate)



EcoNomics

EcoNomics™ Delivering profitable sustainability

Our approach to delivering sustainable and profitable projects for our customers



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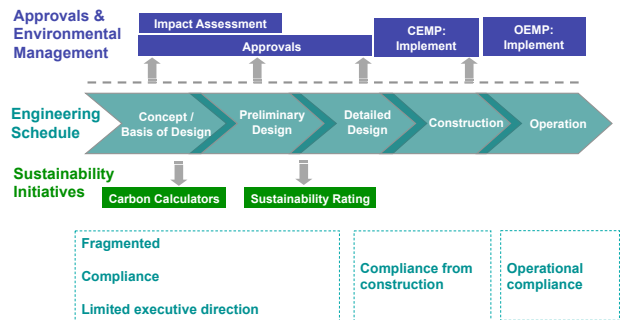
EcoNomics



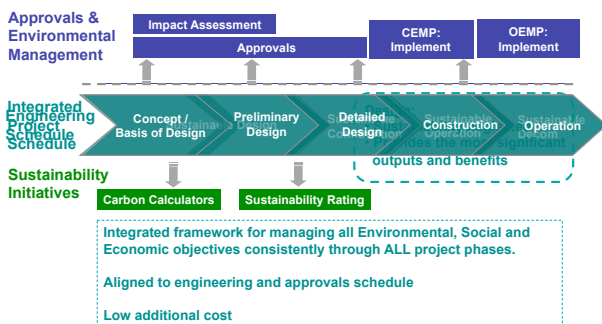
EcoNomics™ Embedded Delivery

- ▶ EcoNomics™ Embedded Delivery provides a single sustainability framework for project delivery
- ▶ Incorporates environmental and social compliance and sustainability outcomes (beyond compliance)
- ▶ Financial savings through improved engineering decisions
- ▶ Enables the capturing and reporting of sustainability achievements
- ▶ Integrating sustainability across a project delivery team by way of process and objectives
- ▶ Enables the use of the EcoNomics™ Assessment toolset to identify and assess the most sustainable engineering options
- ▶ This is NOT a collection of sustainability initiatives

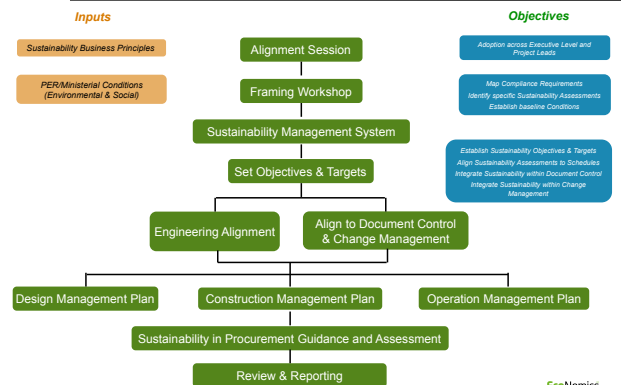
EcoNomics



EcoNomics



EcoNomics



EcoNomics

Sustainability in Design Framework – a dedicated approach to maximise benefits

- Engineering Alignment**
 - ▶ Integrate sustainability framework into engineering schedule
 - ▶ Engineering "Gates" and Design Reviews incorporate sustainability reviews and assessments
- Discipline Guidance Documents**
 - ▶ Discipline Guidance Documents to define compliance requirements relevant to each discipline
 - ▶ Capture sustainable engineering opportunities and assessment schedules
- Discipline Compliance & Opportunity Workshops**
 - ▶ Workshops with each Discipline team to convey compliance requirements and identify Sustainable opportunities
 - ▶ Define input requirements from engineering to enable assessments
- Compliance & Opportunity Registers**
 - ▶ Registers and capture requirements and opportunities to convey back through to Executive and procurement teams
- Sustainability Assessments**
 - ▶ Sustainability Assessments utilising EcoNomics™ tools to identify best option
 - ▶ Timed to Engineering "Gates" within Engineering Schedule
- Capture & Reporting**
 - ▶ Outcomes from assessments captured and reported internally and externally

Case Study

Southern SeaWater Desalination Plant

Desalination plant (SSWA supply):

- 50 GL per year plant / expandable to 100 GL per year
 - Marine for 100GL
 - Seawater Pump Station sized for 100GL
 - Pipelines to Pre-treatment for 100GL



Embedding Sustainability

Case Study

Southern Seawater Desalination Plant

- High profile 'state significant' project
- Design, construction & operation

Embedded Delivery approach built into project delivery

- Adoption of sustainability Executive level
- Different project team set up
- Applied sustainability at early stage of design decision making

Additional resource: ~ 2 FTE

Embedding Sustainability

Case Study

Southern Seawater Desalination Plant

Highlights to date include:

Delivered within a management framework

- **Resource Efficiency:** Mapping and improving the resource balance
- **Sustainable procurement:** Embedded throughout the supply chain
- Utilising our EIP to capture innovation as a metric in itself

Embedding Sustainability

Case Study

Southern Seawater Desalination Plant

Sustainability outcomes to date include:

- 104 design innovations captured
- 60% design innovations implemented
- \$4.38M Capex Saving
- 14,800 Tonnes of virgin material avoidance
- 110,000 kwh of energy saved 3,120 tonnes of CO2 saved
- 164,000 litres of potable water saved
- 100% of suppliers through the Sustainable Procurement process

Southern Seawater Alliance Perth Office Induction

SECTION FOUR: **SUSTAINABILITY**

SSWA Sustainability Objectives

- The Alliance is committed to a desalination plant that actively incorporates sustainability within engineering design, construction and operation.
- On this project sustainability cannot be “added on”, it will be embedded as a core component of each engineering and construction team.
- The SSWA project is different in striving to embed sustainability as a core component within each engineering discipline to actively recognise and incorporate sustainability opportunities

Water Corporation Vision

- The sustainability approach during the bid stage was a key element of SSWA success.
- “Sustainability - excellent plan and clear integration into the design process. The approach is world's best practice.”
- Embedding sustainability in each engineering discipline will ensure the Alliance success through to operation

Sustainability During the Bid

To successfully manage sustainability, the project required an effective management system approach. This was developed through the following:

- A SSWA Sustainability Policy
- Sustainability Assessments over different project alternatives
- Sustainability Objectives – developed to provide the key overall strategy focus areas
- The Sustainability Management System (SMS) – this provided a functional management system approach to sustainability incorporating objectives, targets and capturing tools

EcoNomics™ & Sustainability

- **EcoNomics™**
EcoNomics™ is a model for delivering sustainability on engineering projects.
- **Sustainability**
The Sustainability Management System provides the functional tool to capture sustainability achievements and outcomes.
- Together, EcoNomics™ and the Sustainability Management System help ensure that sustainability is embedded in the project.

Sustainability Policy

- Establishing and applying a Sustainability Management System (SMS)
- Complying with all applicable legal requirements
- Utilising continuous improvement to achieve change
- Ensuring the prevention principle
- Assessing the sustainability impact of all historic, current and likely future operations
- Ensuring that the whole SSWA team is aware of their sustainability impacts
- Liaising with the local community
- Establishing sustainability objectives, targets and management plans
- Encouraging our suppliers and contractors to undertake their duties with awareness of their own sustainability responsibilities



Reporting our Success

Reporting of sustainability achievements during the detailed design, construction and operation phases will be essential and are proposed to incorporate the following:

- **Sustainability Summaries**
To be released to the public detailing sustainability achievements, timing to be determined
- **Sustainability Updates**
Issued internally on a monthly basis
- **Ongoing input into SSWA communications**



What's Next

The Sustainability Team will

- hold Sustainability Opportunities Workshops with each Lead Discipline Engineer
- identify critical design and construction decision making meetings/ milestones to be incorporated into the Sustainability Team

Lead Discipline Engineers and Managers must

- incorporate The Sustainability Team into engineering decisions
- ensure sustainability is embedded throughout this project

If we do this right, the Southern Seawater Desalination Plant will be highlighted as one of the first major sustainable design projects in Australia



Your Role in Sustainability

- Every members of the SSWA has a role in sustainability
- If you are involved in decisions on the design and construction and see sustainability opportunities in areas such as alternative materials, move efficient energy use or reduced waste generation, we need to capture this and assess its incorporation in the project
- Contact your sustainability team when undertaking key decisions

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What are we doing differently?

- ▶ **A Comprehensive Sustainability Implementation approach – not a collection of initiatives**
- ▶ **A Sustainability Management System**
- ▶ Establish **sustainability objectives** – applied consistently throughout ALL project phases
- ▶ Framework for **Sustainable Engineering Design**
- ▶ Providing **robust sustainable decision making**
- ▶ **Integrated with engineering schedule** and project teams
- ▶ **Captures achievements** – not just compliance
- ▶ **Dedicated sustainability resource**
- ▶ **Quantify and report** the benefits and savings