Exhaust Control Industries

Protecting our urban environment for over 30 years
About ECI Australia

- Over 30 years of experience in design and manufacture of control solutions that reduce unwanted exhaust and noise emissions.
- Design catalysts for the Mining, Construction, Power Generation, Oil and Gas, Road Transport, Industry, Rail, Marine and Passenger Car markets.
- Full Service offering: Select, Size, Supply and Service.
- Exhaust test facility, capable of testing off-road, on-road and stationary engines up to 900HP with ‘5-gas’ emission testing capability.
ECI’s geographical market extends to a wider definition of Australasia.

Includes Indonesia, PNG, the Pacific Islands and New Zealand.
ECI Facilities

- Mordialloc, Victoria –
  - Manufacturing facility and head office: 2200m²
  - Engine Test Facilities: 750m²
- Huntingdale, Victoria –
  - Heavy Engineering and Acoustic Enclosure manufacturing facility: 3420m²
- Brisbane, Queensland –
  - Factory and office: 750m²
- Total: 7120m²
- In addition, we have technical and sales representation in WA and Jakarta.
- Total employee count: 44
ECI design, manufacture and supply a range of emission and noise control products:

- Selective catalytic reduction for NOx reduction
- Catalyst systems for CO, HC, PM and NO\textsubscript{x} reduction (lean burn and rich burn engines)
- Passive and active diesel particulate filtration systems for stationary and off-road equipment
- 2-stage diesel particulate catalyst systems
- Exhaust waste heat recovery – hot water/steam service
- Acoustic enclosures, modular panel systems and/or plant room acoustic treatment
- Ventilation systems for air handling
- Fuel systems including tanks, pipework and control technology
- Full mechanical installation service available
- Silencers – exhaust and air handling silencers
- Emission and noise testing service is also available
Capabilities

- Design
- Project Management
- Installation
- Handover and Training
- Servicing

TURN KEY SOLUTIONS

- Recent projects
- Products to support these projects
Design

- Acoustic assessment - room and exhaust
- Room layouts / sizing
- Backpressure assessment
- Thermal growth and appropriate support structures
- Fuel Systems to meet AS1940, including ECI’s own range of PLC fuel controllers
- Emissions control solutions
Project Management

- Project management staff base
  - Melbourne
  - Brisbane
  - Perth

- Happy to travel - local or remote
  - Australia wide
  - PNG
  - Pacific Islands
  - South East Asia and Indonesia
Installations

- Installation teams staff base
  - Melbourne
  - Brisbane
  - Perth (in development)

- Happy to travel - local or remote
  - Australia wide
  - PNG
  - Pacific Islands
  - South East Asia and Indonesia
Exhaust Emission Control Technologies

- Diesel Engines
  - Selective Catalytic Reduction (SCR) Systems for control of NOx
  - Diesel Particulate Filters (DPF) for diesel particulate removal (Armourtech™)
  - Diesel Particulate 2 Stage Catalyst system for partial Diesel particulate reduction (Predator™)
  - Diesel Oxidation Catalyst for carbon monoxide and hydrocarbon reduction
Gas Engines

- Stoichiometric/Rich Burn Engines
  - Three way catalyst system for simultaneous reduction of NOx, CO + non-Methane Hydrocarbons (NMHC) reduction Lean Burn Engines
- Lean Burn Engines
  - SCR Systems for control of NOx
  - Oxidation Catalyst for CO and NMHC
  - Methane Oxidation Catalyst for Methane reduction
### Comparison Emissions: % Reductions by ECI Product

<table>
<thead>
<tr>
<th>Emission</th>
<th>DOC</th>
<th>POC</th>
<th>DPF</th>
<th>CDPF</th>
<th>SCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>HC (Hydrocarbons)</td>
<td>80%</td>
<td>85-95%</td>
<td>N/A</td>
<td>70-95%</td>
<td>N/A</td>
</tr>
<tr>
<td>CO (Carbon Monoxide)</td>
<td>90%</td>
<td>95%</td>
<td>60%</td>
<td>95%</td>
<td>N/A</td>
</tr>
<tr>
<td>NOx (Nitrogen Oxide)</td>
<td>N/A</td>
<td>Up to 10%</td>
<td>N/A</td>
<td>Up to 15%</td>
<td>80-100%</td>
</tr>
<tr>
<td>PM (Particulate Matter)</td>
<td>Up to 20%</td>
<td>Up to 70%</td>
<td>Up to 99%</td>
<td>Up to 99%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Where:
- **DOC** = Diesel Oxidation Catalyst
- **POC** = Particulate Oxidation Catalyst (Predator)
- **DPF** = Diesel Particulate Filter (Armour Tech without DOC)
- **CDPF** = Catalytic Diesel Oxidation Filter (Armour Tech with DOC)
- **SCR** = Selective Catalytic Reduction

Note: Actual unit performance will vary, generally within the ranges noted above, depending on actual operating conditions e.g. engine tune, exhaust oxygen content and exhaust temperatures.
Southern Projects Operations

- 31-33 Fonceca St Mordialloc
- Paul Earley – Manager Southern Operations – 0412 436 465
- James Millward – Engineering Manager – 0432 550 239
- Manufacturing facility and head office: 2200m²
- Engine Test Facilities: 750m²
- Sales, service, installations, design, manufacture
- ECI Centre of Excellence for product design and emissions control solutions
Clarke Energy Project – REEDY CREEK 2

- Drop Over Enclosure 80 dB(A) @ 1m for JGS 620 Gas Engine with removable end wall
- Size 4m Wide X 3.95m High X 17.9m Long Weight 17 Tonnes
- Construction: 3mm Outer Galvanised Skin with 32Kg/m3 Glass Fibre Acoustic Infill & Galvanised Perforated sheet internal
- Internal structural RHS Frame
Design 30 MW Power Station
Mt Isa Power Station 43 MW
Roc Oil Power Station – Flare Gas
- 5.5 MW, WA
Dyno Nobel – Moranbah – 21 MW
Post Entry Quarantine Facility – Melbourne

Completed designs, drawings Supply and Installation of 3 off acoustic enclosures and equipment as per below to suit Cummins C1675 Gensets.

- **Enclosures**
  - Design, Supply and installation 3 off acoustic enclosures to meet 75db(A) at 1m from walls.

- **Fuel System**
  - Design, Supply and installation of 3 off 10,000lt bulk tank and fuel reticulation system within generator compound.

- **Exhaust System**
  - Enclosures were fitted with Roof mounted, critical grade silencers.
**Modular Acoustic Panel System**

- Flexible manufacturing system
- Panel thickness from 50mm to 100mm and Custom Lengths up to 4 Metres
- Interlocking Acoustic panels
- 1.6mm Galvanised outer skin
- 32kg/m3 Glass Fibre Acoustic Infill
- Perforated inner skin
- Delivered to site flat packed
- Variety of Surface finishes available, ie plain Gal Finish, Powder coated or Colorbond cladding
- Structural Steel required for load bearing applications
- Plasterboard installed internally for higher performance transmission loss
Acoustic Enclosures & Panels
Completed designs, drawings Supply and Installation of equipment as per below to suit 3 x Cummins C 2500 D5 Gensets, all operating at full load.

- **Fuel System**
  - Design, Supply and installation of Bulk Tank, day tanks, fuel reticulation system with pipe run of over 450 metres.

- **Ventilation system**
  - Design, Supply and installation of Intake and discharge attenuators, Supply Air Fans and Duct work.
  - The ventilation system was designed for a 10 °C temp rise across the plant room for the C 2500 D5 Heat Exchange Cooled sets, running at full load.

- **Exhaust System**
  - Design, Supply and installation of exhaust system to including 3 off 450mm diameter stainless steel flues, Hospital Grade Super Critical Silencers, oval in shape to suit available space above Genset and purposed built to house Predator 2 Stage Particulate Catalyst System to reduce CO, HC and PM.

- **Cooling system**
  - Design, Supply and installation of 3 of Heat Exchangers including piping to genset and building header piping tied to Cooling towers.
Projects – VCCC
Completed designs, drawings Supply and Installation of equipment as per below to suit 2 x Cummins C 1700 D5 Gensets, and 2 x 1300kva Mitsubishi DRUPS units all operating at full load.

- **Fuel System**
  - Design, Supply and installation of day tanks, fuel reticulation system within plant room.

- **Ventilation system**
  - Design, Supply and installation of Intake and discharge attenuators and support stands.
  - The ventilation system was designed for a 10 °C temp rise across the plant room for the 4 engines running at full load.

- **Exhaust System**
  - Design, Supply and installation of exhaust system to including 4 off 450mm diameter stainless steel flues, Hospital Grade Super Critical Silencers and installation onto prefabricated support frame which allowed a complex post-roof installation possible.

- **Cooling system**
  - Design, Supply and installation of piping for DRUPS system.
Projects – Bendigo Hospital
Digital Realty Data Centre – Deer Park Victoria

Completed designs, drawings Supply and Installation of 6 off acoustic enclosures and equipment as per below to suit Cummins C2250 Gensets.

- **Enclosures**
  - Design, Supply and installation 6 off acoustic enclosures to meet 75db(A) at 1m from walls.

- **Fuel System**
  - Design, Supply and installation of 20,000lt Base frame fuel tank and fuel reticulation system within enclosure room.

- **Exhaust System**
  - Enclosures were fitted with Critical grade silencers and in built predator catalyst systems.
Projects – 567 Collins Street

567 Collins St. Commercial Tower & Leighton HQ Victoria

Completed designs, drawings Supply and Installation of 2 off MTU 1400kva Diesel and 1 off 800kva Gas co-gen system equipment as below

- **Exhaust System**
  - Design, Supply and installation of exhaust systems to including stainless steel flues, Hospital Grade Super Critical Silencers and installation suspended from ceiling.

- **Fuel System**
  - Design, Supply and installation of 1off 20,000lt bulk tank and fuel reticulation system from Basement level to generators on level 4.

- **Cooling system**
  - Design, Supply and installation of *exhaust waste heat recovery system* piping for gas generator system.
Telstra Exhibition St Exchange (2011/2012)

- ECI worked with Telstra and Transfield Services to achieve reductions in noise and exhaust pollution at their flagship exchange building in Melbourne’s CBD. ECI designed, manufactured, and installed a complex range of product solutions and provided auditing and project management expertise.

- Due to nearby residents complaints over noise and pollution ECI were contracted to retro-fit existing installation in Victoria’s largest telephone exchange including:
  - Acoustic enclosures/treatment
  - Silencers and exhaust systems
  - Plant room installation
  - Emissions control (oxidation catalyst)
Projects - Telstra Exhibition St

2 x LARGE DOUBLE DOORS FOR SERVICEABILITY AND EQUIPMENT ACCESS.

CENTRAL FILTRATION WALL IS BUILT IN LINE WITH LOAD BEARING COLUMNS.

ACOUSTIC ENCLOSURE BUILT TO ATTENUATE BREAKOUT NOISE FROM THE GENERATOR ROOMS.
Projects - Telstra Exhibition St
Northern Operations

- 31 Flanders Street, Salisbury QLD 4107
- Lee Gunn – Manager Northern Operations – 0422 016 566
- Factory, office & workshop: 750m²
- Sales, service, installations
- ECI Centre of Excellence for SCR and fuel control systems
Projects – PNG

Bank of South Pacific - three new banking facilities in Port Moresby

- Each having:
  - Acoustic design, manufacture and installation
  - Turn key fuel systems including proprietary fuel polishing integration and ECI fuel controllers
  - Container tank farms – 2x 30,000L ISO bulk tanks
  - Underground bulk tank storage 2x 20,000L Underground Glassteel bulk tanks
Projects - PNG
Manus Island Processing Facility

- **4 x No. 2MW containerised gensets – 40’ ISO’s**
- **550,000L diesel tank farm:**
  - Full fuel system design to AS1940
  - Wharf pumping and metering system
  - Fuel laundering by coalescence and dedicated particulate filtering
  - Fuel transfer and interlocked overflow control of four enclosure day tanks, site boiler skid day tanks and a vehicle refilling bowser
  - Site mobilization and installation
  - Supply and commissioning of ECI integrated PLC fuel controller
  - Training and Handover
Projects – Manus Island
Sunshine Coast University Hospital (SCUH) - Central Energy Plant Emergency Standby Power

- **200,000L underground diesel tank farm**
  - Full fuel system design to AS1940
  - Full civil contract for the tank excavation and trenching including sheet piling a 15m x 15m x 5.5m deep tank pit, dewatering, water and spoil treatment, etc...
  - Fuel laundering by coalescence and dedicated particulate filtering
  - Fuel transfer and interlocked overflow control of four enclosure day tanks
  - Site mobilization and installation
  - Supply and commissioning of ECI integrated PLC fuel controller
  - Training and Handover
Freeport Diesel SCR NOx Abatement Installation for new 5MW Caterpillar

- Integration of SCR plant into existing Power Station, including:
  - New 900NB exhaust system
  - Rebuild of service platforms and stairs – External and internal
  - New SCR plant – mixing duct, reactor, vertical exhaust/stack
  - Reconfigure urea storage and transfer
  - Electrical and wiring supply and design – installation by site electrical staff
  - Supply, installation and commissioning of SCR controller including remote local and remote HMI.

- Site mobilization and installation
- Shipping and Freight coordination
Projects – Freeport Grasberg Mine
Projects – Freeport Grasberg Mine
Coolangatta Airport Control Tower

- Acoustic design and installation of new generator room including:
  - Primary secondary exhaust silencers
  - Air flow and attenuation
  - Acoustically line room
  - Room bunding, including fuel line bunding of all transfer lines
- Full fuel system design to AS1940
- Custom built diesel tank farm with built in pump end for fuel laundering and process measurement
- Fuel laundering by coalescence and dedicated particulate filtering
- Fuel transfer and pumped return tank overflow control of two new day tanks
- Site mobilization and installation
- Supply and commissioning of ECI integrated PLC fuel controllers (x2)
- Training and Handover
Projects – Coolangatta Airport
Noumea Mont-Dore Power Station
Site assessment and rebuild of new acoustic enclosures

- Acoustic assessment and design.
- Supply only modifications to existing Chinese built enclosures. Stage 1:
  - New supply air attenuators
  - New discharge attenuators
  - All existing openings (10 per enclosure) blanked off
- Shipping and Freight coordination
Lady Cilento Children’s Hospital, Brisbane

- **Scope:**
  - 2 x JMS 616 2.4MW Gas Engines
  - 4 x MTU 20V-4000 3000 kVA Diesel Engines
  - 11 x Gas Hot Water Boilers

- Complete turnkey of exhaust for above, including design, fabrication, installation and commissioning.

- **Gas Engines - includes:**
  - SCR NOx Reduction System
  - Oxidation Catalyst for CO + NMHC reduction
  - Exhaust Waste Heat Recovery Silencer for hot water service
  - Exhaust Bypass Diverter Valve with Electric Actuator
  - Exhaust Silencer
  - Exhaust Pipework in Bellows & Support
  - Thermal Insulation
Projects - QCHEP

- Diesel Engines - includes:
  - Diesel Particulate 2-stage Catalytic system for DPM, CO + HC reduction
  - Exhaust Silencers
  - Exhaust Pipework, Bellows & Supports
  - Thermal Insulation
- Hot Water Boilers
- Exhaust Pipework and Support
Projects - QCHEP

QCH SCR-SYSTEM 1

QCH SCR SYSTEM 2
PLC Fuel Controllers – standard or customer built

- Powder coated mild steel control panel. Stainless Steel grade on request
- Beckhoff PLC embedded controller complete with IEC 61131 programming
- Networking and bus options available (many available)
- Modular design where I/O is configured to match the task – thus limited cost for spare I/O
- LED indication and alarming (standard)
- Auto/Manual/Off selector switches for pump control
- Segregated Low Voltage[LV] and Extra Low Voltage[ELV] wiring
- Volt free outputs for remote monitoring, via interposing relays -25 points
- Designated field wiring terminals for all field equipment
- Colour coded wiring
- Quality components
- Full set of AutoCAD drawings
- Operation and Maintenance manuals
- ITP commissioning documentation.
- On-site commissioning offered
Fuel Controller Options: 7”, 10”, 12”, 15” Touch Screen HMI complete with three display pages:
- Mechanical single line (plant view page)
- System Status (status page)
- Alarms (alarms page)
- Stainless Steel Enclosure
- Custom Builds
**PLC Fuel Controllers**

- **Market differentiation:**
  - **PLC.** Not ‘black box’ microprocessor, nor programmable relay or relay logic
  - **Standard controllers, also custom designed**
  - **Modular design** means limited wasted I/O
  - **Talks to most high level typologies** – if required.
  - **On site commissioning.** Pricing on Application
  - **Technical Support**
ECI Contacts

Dean Marchiandi – Managing Director
✆ 0408 058 584 ✉ dean@exhaustcontrol.com.au

Jim Fogarty – General Manager
✆ 0413 132 026 ✉ jim@exhaustcontrol.com.au

James Millward – Engineering Manager
✆ 0432 550 239 ✉ james@exhaustcontrol.com.au

Paul Early – Manager Southern Operations
✆ 0412 436 465 ✉ paul@exhaustcontrol.com.au

Lee Gunn – Manager Northern Operations
✆ 0422 016 566 ✉ lee@exhaustcontrol.com.au

Tim Islip – Manager Western Operations
✆ 0427 382 148 ✉ tim@exhaustcontrol.com.au

Erwin Surya – Indonesia Operations
✆ +62 (811) 1880 193 ✉ erwin@exhaustcontrol.com.au