

# THE “DIRTY 3”

THE TRUTH ABOUT AGL, ENERGIAUSTRALIA AND ORIGIN

# WHY THE TRUTH NEEDS TO BE TOLD

Australia's three largest energy companies, AGL, EnergyAustralia and Origin, all generate and retail electricity from dirty power. That means they are responsible for a significant amount of Australia's carbon emissions and toxic air pollution.

**We know that fine particle pollution from coal-fired power stations has a devastating health impact throughout Australia.<sup>1</sup> And some of the most polluting power stations in Australia are owned by AGL, EnergyAustralia and Origin Energy.<sup>2</sup>**

The "Dirty Three" have also been lobbying against the Renewable Energy Target (RET)<sup>3</sup>, a critical policy that is reducing pollution and underpins Australia's transition to cleaner and more sustainable energy.

**Nearly 9 out of 10 Australians say they support renewable energy and the RET, and want to see a transition from dirty power to clean and sustainable energy.<sup>4</sup>**

But consumers find it hard to know who to trust when there is a lack of easy-to-understand information and a lot of greenwash and PR spin surrounding renewable energy and pollution.

This research is part of GetUp's Better Power campaign. Using the latest data from the National Pollutant Inventory, the Australian Conservation Foundation's "Top Ten Climate Polluters" list and reports and data from Market Forces and the Climate and Health Alliance, GetUp has worked with Dr James Whelan, Market Forces and Environmental Justice Australia to outline the extent of AGL, Energy Australia and Origin's toxic air pollution and carbon emissions. The report also investigates whether these three companies could reasonably claim to support renewable energy both in terms of their investments and their lobbying of government, by looking at how they generate electricity and their position on the Renewable Energy Target.

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<sup>1</sup> 2015 'Air pollution 'killing more than roads'', Business Spectator 2 April; Climate Council 2014, Climate Council Briefing Paper: Health Effects of Coal.

<sup>2</sup> Based on National Pollutant Inventory data, Available from <npi.gov.au>.

<sup>3</sup> John Hewson 2015, 'The real villains in Australia's renewables debacle? Three big energy companies', The Guardian 26 March.

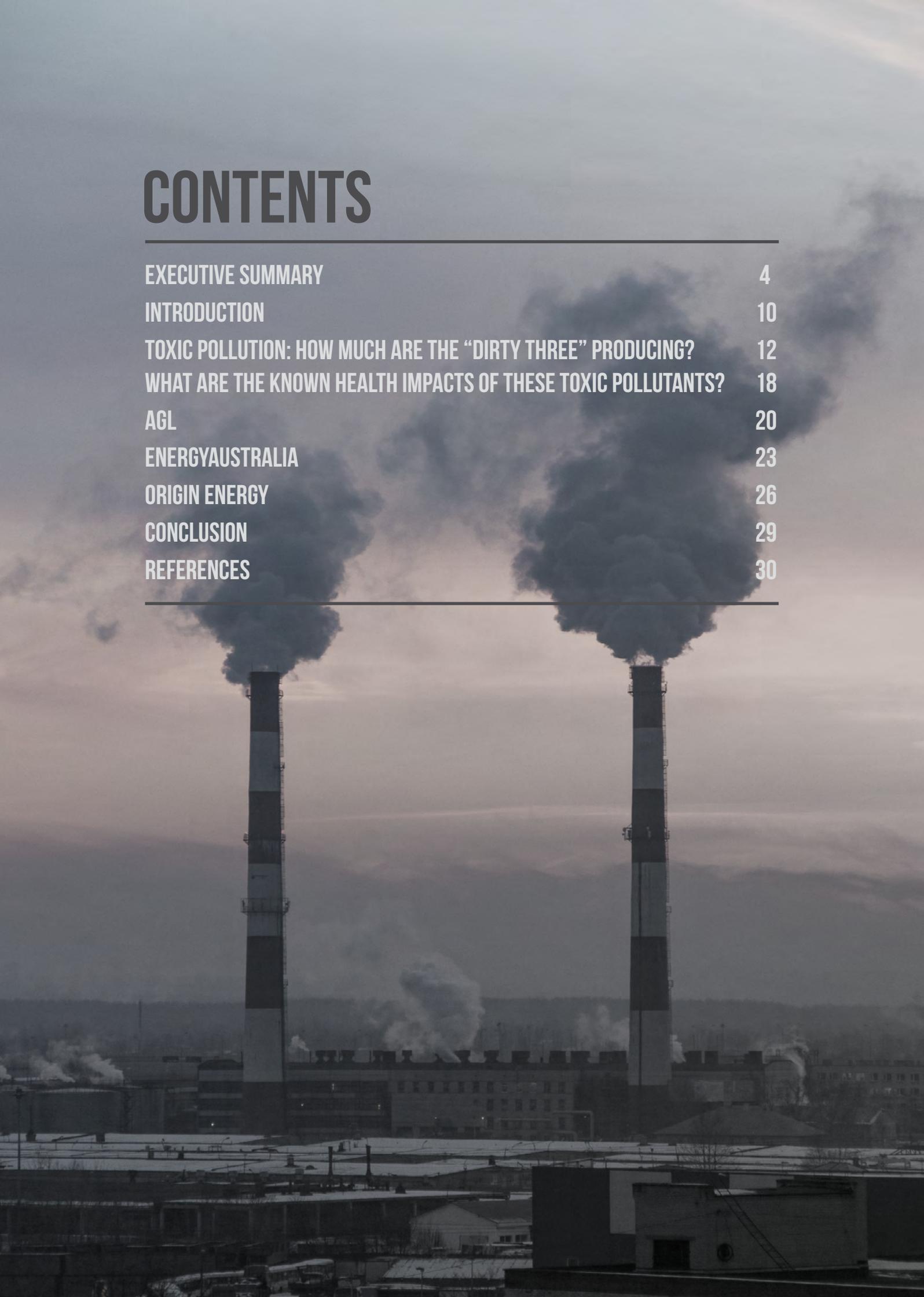
<sup>4</sup> Lenore Taylor 2014, 'Almost 90% of Australians support renewable energy target, says poll', The Guardian 2 December.

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# EXECUTIVE SUMMARY

Australia's three largest energy companies, AGL, EnergyAustralia and Origin, all claim to support Australia's transition from dirty power to clean renewable energy and to be taking action to reduce carbon emissions.

But in reality, the vast majority of the profits the "Dirty Three" make come from generating and selling electricity from coal, oil and gas and all three are lobbying against the Renewable Energy Target, policy critical to Australia's clean energy future.

## USING THE LATEST DATA<sup>5</sup> ON TOXIC AIR POLLUTION, THIS REPORT OUTLINES:



the carbon emissions and toxic air pollution produced by AGL, EnergyAustralia and Origin for 2013-14;



the known health impacts of the pollutants produced by these companies;



the percentage of the energy they generate from coal, oil and gas, compared to renewable sources and their income from renewable energy; and



the lobbying position they have taken on the Renewable Energy Target.

## KEY FINDINGS

**AGL, EnergyAustralia and Origin Energy - the "Dirty Three", are investing in and supporting dirty power in Australia, despite their claims to support renewable energy. Together and individually, emissions from the dirty power stations operated by these three big companies make up a significant amount of Australia's carbon emissions, that are causing climate change and damaging our environment, as well as producing types of toxic pollutants which are known to be detrimental to Australians' health and to our environment.<sup>6</sup>**

<sup>5</sup> From Australian Government Department of the Environment 2015, National Pollutant Inventory, Available from <npi.gov.au>; Climate and Health Alliance website 2015. Available from <caha.org.au>; Australian Conservation Foundation 2015, Australia's Top 10 Climate Polluters; Market Forces Research Briefings 2015. Available from <<http://www.marketforces.org.au>>.

<sup>6</sup> Toxic air pollution involves the emission of toxic substances into the air, that may be harmful to the environment and to human health if inhaled, swallowed, or absorbed through the skin. Toxic substances emitted through the generation of coal-fired power include PM<sub>2.5</sub>, PM<sub>10</sub>, sulfur dioxide, carbon monoxide, oxides of nitrogen, volatile organic compounds (VOC) and hydrochloric acid.

## HOW MUCH DO THEY CONTRIBUTE TO AUSTRALIA'S CARBON EMISSIONS?

The “Dirty Three’s” dirty power stations and their operations are responsible for almost half (46 percent) the carbon pollution produced by Australia’s 10 most polluting companies, including big coal mining companies. Together their dirty power stations and their operations are responsible for a massive 13 percent of Australia’s total carbon emissions.



Following its acquisition of Macquarie Generation, AGL is now Australia’s worst polluter in terms of carbon emissions.



AGL’s total carbon emissions in 2013-14 were in excess of 40,000,000 tonnes CO<sub>2</sub> e: 7.5% of Australia’s total carbon emissions.



EnergyAustralia’s total carbon emissions in 2013-14 were 20, 810,266 tonnes CO<sub>2</sub> e: 3.9% of Australia’s total carbon emissions.



Origin Energy’s total carbon emissions in 2013-14 were 12,737,691 tonnes CO<sub>2</sub> e: 2.4% of Australia’s total carbon emissions.

## HOW MUCH TOXIC POLLUTION ARE THEY EMITTING?

Toxic emissions reported from EnergyAustralia and Origin’s dirty power stations increased by more than 500 percent during the last year.<sup>7</sup> Toxic emissions from AGL’s dirty power stations are now more than 20 times higher than five years ago<sup>8</sup>.

The types of reported toxins emitted at AGL, EnergyAustralia and Origin’s dirty power stations have been linked with a spectrum of illnesses from cancer, to respiratory diseases including asthma, to dermatitis.<sup>9</sup> The pollutant levels from their operations have significantly increased in the past 12 months due to their further investment in dirty power.<sup>10</sup>

**Based on 2013-14 National Pollutant Inventory data, collectively, AGL, EnergyAustralia and Origin’s reported emissions account for 11 percent of total national emissions of PM<sub>2.5</sub> - the pollutant considered to be responsible for the most significant health impact throughout Australia.**<sup>11</sup> Three of the top PM<sub>2.5</sub> reported sources are “Dirty Three” power stations (AGL’s Loy Yang is number one, followed by EnergyAustralia’s Yallourn and Wallerawang power stations).

**Additionally, together AGL, Energy Australia and Origin are also responsible for more than one-third (37%) of all reported hydrochloric acid emissions.**<sup>12</sup> Two of the top ten reported sources of hydrochloric acid nationally are “Dirty Three” facilities. AGL’s Loy Yang dirty power station is number one for hydrochloric acid followed by EnergyAustralia’s Mount Piper dirty power station.

<sup>7</sup> Based on Australian Government Department of the Environment 2015, National Pollutant Inventory data. Available from <npi.gov.au>.

<sup>8</sup> Ibid.

<sup>9</sup> Ibid.

<sup>10</sup> Comparing their 2012-13 National Pollutant Inventory report and the subsequent 2013-14 report published 1 April 2015.

<sup>11</sup> 1971 facilities reported emissions of PM<sub>2.5</sub>. See Australian Government Department of the Environment 2015, National Pollutant Inventory, Available from <npi.gov.au>.

<sup>12</sup> 323 facilities reported emissions of hydrochloric acid. Ibid.

## HOW DO THEY GENERATE ELECTRICITY?



81% of the electricity produced by AGL owned generators comes from coal, 7% gas and a declining 11% renewables.



86% of the electricity produced by EnergyAustralia owned generators comes from coal, 13 percent from gas and just 1.96 percent from renewables.



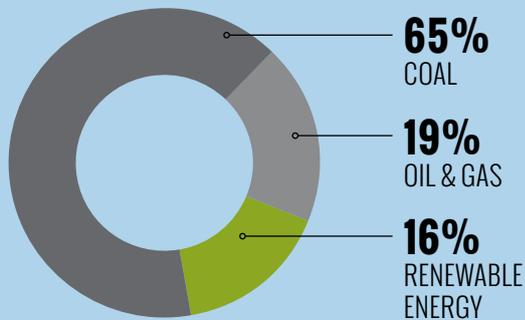
66% of the electricity produced by Origin owned generators comes from coal, 33% from gas and less than one percent from renewables.

## WHAT IS THEIR POSITION ON RENEWABLE ENERGY?

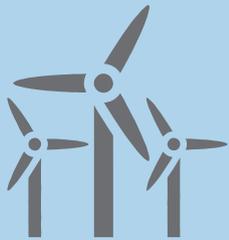
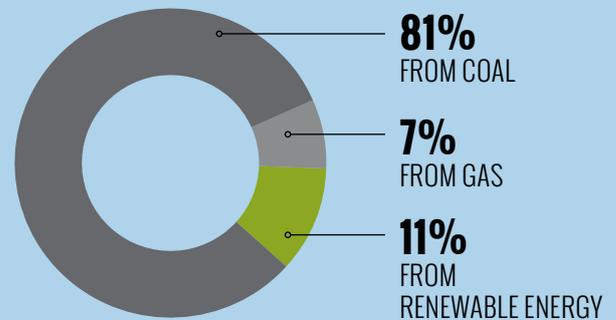
**AGL, EnergyAustralia and Origin have all been lobbying for the Renewable Energy Target to be either significantly reduced or scrapped.**

This report finds that while the “Dirty Three” claim to support renewable energy, their significant and continued investments in dirty power, and their lobbying against renewable energy to protect those investments, tell a different story.

## AGL'S ELECTRICITY PRODUCTION CAPACITY<sup>1</sup>



## AGL'S ELECTRICITY GENERATION<sup>1</sup>



PROPORTION OF REVENUE DERIVED FROM RENEWABLE ENERGY:  
**LESS THAN 8%**<sup>1</sup>



CARBON EMISSIONS FROM ELECTRICITY GENERATION:  
**40 302 109**  
TONNES OF CO<sub>2</sub><sup>2</sup>

TOXIC POLLUTION EMISSIONS  
**2012-13:**

**88.32 MILLION KG**

TOXIC POLLUTION EMISSIONS  
**2013-14:**

**97.57 MILLION KG**

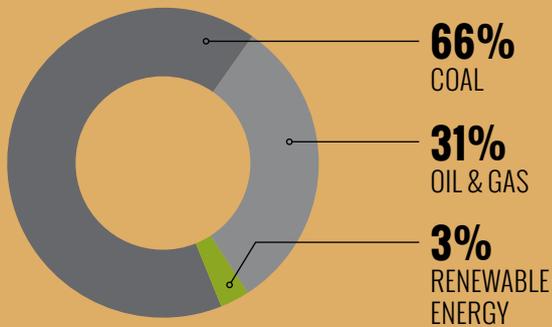
**= 10.5% ↑**  
INCREASE

1. Market Forces <http://www.marketforces.org.au/wp-content/uploads/2015/03/MFRB-AGL.pdf>

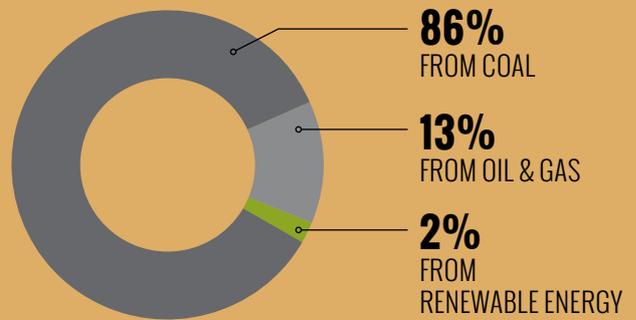
2. ACF Top Ten Polluters report [https://www.acfonline.org.au/sites/default/files/resources/ACF\\_Biggest\\_Polluters\\_Report\\_FINAL\\_V1.2.pdf](https://www.acfonline.org.au/sites/default/files/resources/ACF_Biggest_Polluters_Report_FINAL_V1.2.pdf)

# ENERGY AUSTRALIA

## ENERGY AUSTRALIA'S ELECTRICITY PRODUCTION CAPACITY<sup>1</sup>



## ENERGY AUSTRALIA'S ELECTRICITY GENERATION<sup>1</sup>



PROPORTION OF REVENUE DERIVED FROM RENEWABLE ENERGY:  
**1.67%**<sup>1</sup>



CARBON EMISSIONS FROM ELECTRICITY GENERATION:  
**20 810 266**  
TONNES OF CO<sub>2</sub><sup>2</sup>

TOXIC POLLUTION EMISSIONS  
**2012-13:**

**20.95 MILLION KG**

TOXIC POLLUTION EMISSIONS  
**2013-14:**

**131.9 MILLION KG**

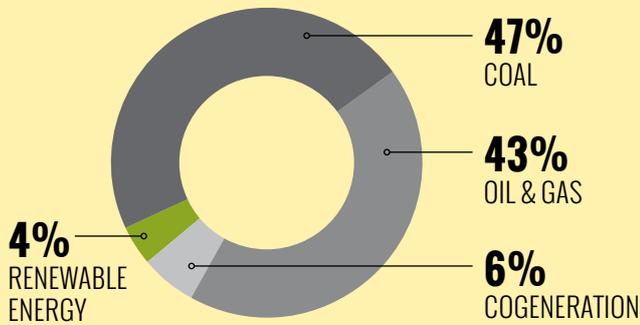
**= 530% ↑**  
INCREASE

1. Market Forces <http://www.marketforces.org.au/wp-content/uploads/2015/03/MFRB-Energy-Australia.pdf>

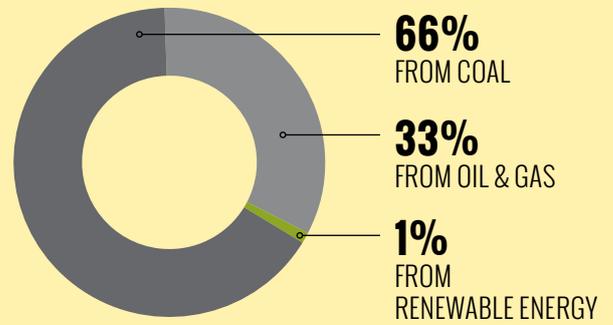
2. ACF Top Ten Polluters report [https://www.acfonline.org.au/sites/default/files/resources/ACF\\_Biggest\\_Polluters\\_Report\\_FINAL\\_V1.2.pdf](https://www.acfonline.org.au/sites/default/files/resources/ACF_Biggest_Polluters_Report_FINAL_V1.2.pdf)

# ORIGIN ENERGY

## ORIGIN'S ELECTRICITY PRODUCTION CAPACITY<sup>1</sup>



## ORIGIN'S ELECTRICITY GENERATION<sup>1</sup>



PROPORTION OF REVENUE DERIVED FROM RENEWABLE ENERGY:  
**LESS THAN 1%**<sup>1</sup>



CARBON EMISSIONS FROM ELECTRICITY GENERATION:  
**12 737 691 TONNES OF CO<sub>2</sub>**<sup>2</sup>

TOXIC POLLUTION EMISSIONS  
**2012-13:**

**8 MILLION KG**

TOXIC POLLUTION EMISSIONS  
**2013-14:**

**50.2 MILLION KG**

**= 527.5% ↑**  
INCREASE

1. Market Forces <http://www.marketforces.org.au/wp-content/uploads/2015/03/MFRB-Origin.pdf>

2. ACF Top Ten Polluters report [https://www.acfonline.org.au/sites/default/files/resources/ACF\\_Biggest\\_Polluters\\_Report\\_FINAL\\_V1.2.pdf](https://www.acfonline.org.au/sites/default/files/resources/ACF_Biggest_Polluters_Report_FINAL_V1.2.pdf)

# INTRODUCTION

Australia's three largest energy companies, AGL, EnergyAustralia and Origin, all generate and retail electricity from dirty power<sup>13</sup> which results in carbon emissions and toxic air pollution.

**Over 70% of Australians buy their electricity from AGL, EnergyAustralia and Origin across the competitive energy markets of Victoria, New South Wales, South East Queensland and South Australia. The "Dirty Three" also control almost half (46%) of the total energy generation in Australia.**<sup>14</sup>

By recording the toxic pollution emitted by individual power stations in Australia, the National Pollution Inventory has revealed what kinds of pollutants AGL, EnergyAustralia and Origin's dirty power stations emit, and in what quantities.<sup>15</sup>

The toxic emissions produced by these companies' power stations currently total more than 279.67 million kg per year.<sup>16</sup>

**And collectively the "Dirty Three's" current emissions per year are 73.8 million tonnes of CO<sub>2</sub> e.<sup>17</sup> That is over 13% of Australia's total carbon emissions,<sup>18</sup> or almost half (46%) of the carbon emissions of Australia's top ten polluters.**

Following increased investments in dirty power generation by the companies, the pollution figures have been rising.

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<sup>13</sup> Three private retailers, AGL Energy, Origin Energy and EnergyAustralia, jointly supplied over 70% of small electricity customers at 30 June 2014. Vertical integration with the generation sector increased following AGL Energy's acquisition of Macquarie Generation in 2014. Overall, the three major retailers now control 46 percent of generation capacity, up from 15 percent in 2009": Australian Energy Regulator State of the Energy Market Report 2014.

<sup>14</sup> Australian Energy Regulator State of the Energy Market Report 2014.

<sup>15</sup> The National Pollutant Inventory measured emissions for the 2013-2014 period.

<sup>16</sup> Aggregated data from Australian Government Department of the Environment 2015, National Pollutant Inventory, Available from <npi.gov.au>.

<sup>17</sup> Based on Market Forces data: 73.8 million tonnes of CO<sub>2</sub> e is an estimated total of the combined CO<sub>2</sub> e emissions from AGL (40,316,294 tonnes), EnergyAustralia (20,810,266 tonnes) and Origin (12,737,691 tonnes). Data available from <<http://www.marketforces.org.au>>.

<sup>18</sup> Australia's total carbon emissions as at September 2014 were approximately 535.9 million tonnes. Australia's National Greenhouse Accounts 2015, Quarterly Update of Australia's National Greenhouse Gas Inventory: September 2014.

# INTRODUCTION CONT.

The carbon and pollution emitted by these big power companies has a profoundly negative impact on Australia's environment. They also impact human health. According to the Climate Council and the Climate and Health Alliance the adverse impact on health, including associated respiratory, cardiovascular and nervous system diseases, from coal-fired electricity generation costs the Australian economy around \$2.6 billion annually.<sup>19</sup>

**The exact health impacts on Australian communities living in close proximity to dirty energy generation is yet to be determined, as, unfortunately, very little research has been undertaken. However, data from Environmental Justice Australia has shown that more Australians die from the effects of air pollution than from car crashes. It is clear that not enough is being done to monitor and control the toxic pollution coming from coal-fired power stations.<sup>20</sup>**

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<sup>19</sup> Climate Council 2014, Climate Council Briefing Paper: Health Effects of Coal.

<sup>20</sup> Environmental Justice Australia 2015, Big growth in pollution from QLD coal industry: new data shows health and environment groups call for national Air Pollution Prevention Act, 2 April. See also Australian Government Department of the Environment 2015, Discussion Paper: Working towards a national Clean Air Agreement: "The health costs of air pollution in Australia have been estimated to be in the order of \$11.1 billion to \$24.3 billion annually in Australia" (p.7).

# TOXIC POLLUTION: HOW MUCH ARE THE “DIRTY THREE” PRODUCING?

Toxic pollution emissions from AGL, EnergyAustralia and Origin’s dirty power stations reported to the NPI account for 11% of total national emissions of PM<sub>2.5</sub> - the pollutant that is considered to be responsible for the most significant health impact throughout Australia.<sup>21</sup>

Three of the top PM<sub>2.5</sub> reported sources of pollution are from “Dirty Three” power stations (AGL’s Loy Yang is number one, followed by Energy Australia’s Yallourn and Wallerawang power stations).

**Reported emissions indicate that more than one-third (37%) of all reported hydrochloric acid emissions in Australia come from AGL, EnergyAustralia and Origin’s dirty power stations.**<sup>22</sup> Two of the top 10 sources of emissions hydrochloric acid nationally are reported to be from “Dirty Three” facilities: AGL’s Loy Yang power station is at number one and EnergyAustralia’s Mount Piper at number two. Emissions from the “Dirty Three’s” dirty power stations are also reported to account for 12% of sulfur dioxide (SO<sub>2</sub>) emissions.<sup>23</sup>

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<sup>21</sup> 1971 facilities reported emissions of PM<sub>2.5</sub>. See Australian Government Department of the Environment 2015, National Pollutant Inventory, Available from <npi.gov.au>.

<sup>22</sup> 323 facilities reported emissions of hydrochloric acid. Ibid.

<sup>23</sup> From all 2036 facilities nationally that reported SO<sub>2</sub> emissions. Ibid.

## HOW MUCH TOXIC POLLUTION IS AGL'S POWER STATIONS PRODUCING?

In the 2013-14 National Pollutant Inventory (NPI), AGL reported emitting 97.5 million kilograms of toxic substances from 20 facilities, a 10% increase in the total toxic emissions it reported in 2012-13 (up from 88.3 million kilograms).

**During the last five years, reported toxic emissions from AGL's dirty power stations have grown by more than 20 times** as the company has expanded its operations to include additional power stations, gas plants, landfill flares and gasfields.<sup>24</sup>

TOXIC POLLUTION EMISSIONS  
**2012-13:**

**88.32 MILLION KG**

TOXIC POLLUTION EMISSIONS  
**2013-14:**

**97.57 MILLION KG**

**= 10.5% ↑**  
INCREASE

### ACROSS AUSTRALIA, AGL OPERATES:

- 9 landfill facilities (including flares) in Kincumber (NSW); Shoalhaven (NSW); Woy Woy (NSW); Coffs Harbour (NSW); Green Point (NSW); Glenorchy (Tas); South Hobart (Tas); Baldivas (WA); and Wagga Wagga (NSW)
- 9 power generation facilities in Loy Yang (Vic); Somerton (Vic); Torrens Island (SA); Regency Park (SA); Orange Grove (WA); Moranbah (Qld); Altona (Vic); Gympie (Qld); and Werribee (Vic); Bayswater (NSW) and Liddell (NSW)
- 1 gas production facility (dehydration and compression of CSG) at Rosalind Park gas plant at Menangle (NSW)
- 1 gasfield in Surat (Qld)

<sup>24</sup> From all 2036 facilities nationally that reported SO2 emissions. Ibid.

**AGL's biggest single source of pollution, the Loy Yang power station in the Latrobe Valley, emitted more than 90 million kilograms of thirty different toxic pollutants and more sulfur dioxide and fine particle pollution (PM2.5) than any other power station in Australia in 2013-14.**

## **AGL'S TOTAL TOXIC POLLUTANT OUTPUT (KG) PER FINANCIAL YEAR 2008-09 TO 2013-14<sup>25</sup>**

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
No of Facilities	11	15	17	19	21	20
Total toxic emissions (Kg)	4 380 005	4 395 789	4 136 494	94 941 920	88 317 751	97 566 579

### **AGL'S FOUR DOMINANT POLLUTANTS (BY MASS) IN 2013-14 FROM THEIR 20 FACILITIES WERE:**

- 60,288,513 kg of sulfur dioxide
- 25,785,783 kg of oxides of nitrogen
- 8,786,243 kg of hydrochloric acid
- 1,468,138 kg of PM<sub>2.5</sub> (fine particles)<sup>26</sup>

**AGL's other toxic pollutants included sulfur dioxide; selenium, toluene, lead, chromium (VI) compounds and chlorine.**

<sup>25</sup> Aggregated data from Australian Government Department of the Environment 2015, National Pollutant Inventory, Available from <npi.gov.au>.

<sup>26</sup> Based on data from Australian Government Department of the Environment 2015, National Pollutant Inventory, Available from <npi.gov.au>.

## HOW MUCH TOXIC POLLUTION IS ENERGY AUSTRALIA'S POWER STATIONS PRODUCING?

In the 2013-14 NPI, EnergyAustralia reported emitting 131,913,529 kg of 18 toxic substances from 6 facilities.

TOXIC POLLUTION EMISSIONS  
**2012-13:**

**20.95 MILLION KG**

TOXIC POLLUTION EMISSIONS  
**2013-14:**

**131.9 MILLION KG**

**= 530%** ↑  
INCREASE

### ENERGY AUSTRALIA OPERATES:

- 5 power stations (one with its own coal mine): Tallawarra (NSW); Yallourn (Vic); Mount Piper (Portland, NSW); Hallett (Canowie, SA); Wallerawang (NSW) Newport (Vic) and Jeeralang (Vic)
- 1 oil and gas extraction facility: Iona (Port Campbell, Vic)

Between the two most recent NPI reports, EnergyAustralia acquired power stations in Portland NSW (the Mount Piper coal-fired power station) and Wallerawang NSW (the Wallerawang coal-fired power station), significantly increasing their reported toxic emissions of several pollutants.

EnergyAustralia's Mt Piper, Wallerawang and Yallourn power stations were Australia's most significant sources of hydrochloric acid in 2013-14, emitting a total of more than 5,600 tonnes to air in 2013-14.

**In the Latrobe Valley, home to EnergyAustralia's Yallourn coal-fired power station and AGL's Loy Yang coal-fired power station, PM<sub>10</sub> reported emissions from electricity generation increased by 28% during the last five years and PM<sub>2.5</sub> reported emissions increased by 25%.**

**EnergyAustralia's Yallourn coal-fired power station is the second highest emitter of toxic PM<sub>2.5</sub> pollution and the third highest emitter of toxic PM<sub>10</sub> pollution in Australia.**

EnergyAustralia's Yallourn and Mount Piper power stations are also two of Australia's top five emitters of hydrochloric acid, emitting 5.6 million kilograms in 2013-14.

Toxic emissions from EnergyAustralia's six facilities that reported in the 2013-14 National Pollutant Inventory included:

- 1,757,800kg of PM<sub>2.5</sub>
- 56,453,579 kg of oxides of nitrogen
- 5,647,000 kg of hydrochloric acid
- 67,012,960 kg of sulfur dioxide<sup>27</sup>

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<sup>27</sup> Based on data from Australian Government Department of the Environment 2015, National Pollutant Inventory, Available from <npi.gov.au>.

## HOW MUCH TOXIC POLLUTION IS ORIGIN'S POWER STATIONS PRODUCING?

In the 2013-14 NPI, Origin reported emitting 50,202,764 kilograms of 20 toxic substances from 19 facilities.

TOXIC POLLUTION EMISSIONS  
**2012-13:**

**8 MILLION KG**

TOXIC POLLUTION EMISSIONS  
**2013-14:**

**50.2 MILLION KG**

**= 527.5%** ↑  
INCREASE

### ORIGIN OPERATES:

- 7 oil and gas extraction and production facilities: Beharra Springs (WA); Geographe (Vic); Jingemina (WA); Lang Lang (Vic); Otway (Vic); Thylacine (Bass Strait, Vic); Yolla A (Bass Strait, Vic)
- 8 power stations: Darling Downs (Qld); Penola (SA); Mortlake (Vic); Uranquinty (NSW); Mt Stuart (Qld); Roma (Qld); Port Adelaide (SA); Eraring (NSW)
- 2 LPG distribution and sales facilities in Tasmania: Devonport (Tas); Launceston (Tas)
- 2 petroleum product wholesaling facilities: Selfs Point (Tas); Port Botany (NSW)

Origin purchased the Eraring power station in New South Wales in 2014, significantly increasing its emissions of toxic pollutants including sulfur dioxide, oxides of nitrogen and fluoride.

Toxic emissions from Origin's nineteen polluting facilities during 2013-14 included:

- 27,590,373 kg of sulfur dioxide
- 20,118,033 kg of oxides of nitrogen
- 956,410 kg of carbon monoxide
- 518,189 kg of fluoride compounds<sup>28</sup>

<sup>28</sup> Based on data from Australian Government Department of the Environment 2015, National Pollutant Inventory, Available from <npi.gov.au>.

## WHAT ARE THE KNOWN HEALTH IMPACTS OF THESE TOXIC POLLUTANTS?

Many of the toxic pollutants emitted by the “Dirty Three’s” dirty power stations can be dangerous even when released into the atmosphere in small masses or at low concentrations. At this stage, there is no data on the direct health impacts, if any, caused specifically by these three companies’ toxic air pollution.

What is known is that the “Dirty Three’s” toxic emissions from dirty power stations have increased, and that the type of pollutants they are emitting are known to cause health effects in different quantities.

**According to the Climate and Health Alliance the adverse impact on health, including associated respiratory, cardiovascular and nervous system diseases, from coal-fired electricity generation costs around \$2.6 billion annually.<sup>29</sup>**

**Long term exposure from coal-fired power generation accounts for 1590 deaths in Australia’s four main cities of Sydney, Melbourne, Brisbane and Perth every year, more than the 2013 national road toll which stood at 1193 deaths.<sup>30</sup>**

Unfortunately there is a lack of consistent monitoring of air, water and soil quality at and around Australian coal mines and coal-fired power stations so the full effects of these pollutants are not known.

This report’s information on the health effects of these pollutants are taken directly from the NPI 2013-14. Information on PM<sub>2.5</sub> (one of the most worrying toxic pollutants given there is no threshold level of exposure at which health effects do not occur) has been provided by Doctors for the Environment.

### HEALTH EFFECTS OF PM<sub>2.5</sub>:

The short term impact of PM<sub>2.5</sub> exposure can be measured by the 2070 hospital admissions for heart disease that occur annually across four major Australian cities.<sup>31</sup>

The risk of lung cancer has also been shown to increase by 18% for every 5 micrograms per cubic meter of PM<sub>2.5</sub> pollution.<sup>32</sup>

Other health effects include:<sup>33</sup>

- increased respiratory symptoms, aggravation of asthma and premature death.
- cancer (e.g. asbestos, chromates)
- irritation of mucous membranes (e.g. acid and alkalis)

**The risks are highest for elderly people and children who are more sensitive to the pollution. There is no threshold at which health effects do not occur.<sup>34</sup>**

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<sup>29</sup> Climate and Health Alliance 2013, Submission to Senate Standing Committees Community Affairs- Inquiry into the Impacts of Health of Air Quality in Australia.

<sup>30</sup> Doctors For the Environment Australia 2014, ‘Medical experts warn scaling back the RET will put more Australians at risk of death and illness’, 23 October.

<sup>31</sup> Ibid.

<sup>32</sup> The Guardian 2013 ‘Air pollution linked to higher risk of lung cancer and heart failure’, 10 July.

<sup>33</sup> Australian Government Department of the Environment 2015, National Pollutant Inventory, Available from <npi.gov.au>.

<sup>34</sup> Ibid.

## **HEALTH EFFECTS OF CARBON MONOXIDE:**

Inhalation of low levels of carbon monoxide (200 parts per million for 2-3 hours) can cause headache, dizziness, light-headedness and fatigue. Exposure to higher concentrations (400 parts per million) of carbon monoxide can cause sleepiness, hallucinations, convulsions, collapse, loss of consciousness and death. It can also cause personality and memory changes, mental confusion and loss of vision.<sup>35</sup>

## **HEALTH EFFECTS OF VOLATILE ORGANIC COMPOUNDS:**

The general effects of exposure to VOCs include: irritation to the eyes, nose and throat; headaches; loss of coordination; nausea; and damage to the liver, kidney and central nervous system. Some VOCs can cause cancer in animals, and some are suspected or are known to cause cancer in humans. The build up of VOCs in indoor environments have also been associated with 'sick building syndrome'.<sup>36</sup>

## **HEALTH EFFECTS OF SULFUR DIOXIDE:**

**Exposure to concentrations of 10 to 50 parts per million for 5 to 15 minutes causes irritation of the eyes, nose and throat, choking and coughing. Other health effects include headache, general discomfort and anxiety. People with impaired heart or lung function and asthmatics are at increased risk. Repeated or prolonged exposure to moderate concentrations may cause inflammation of the respiratory tract, wheezing and lung damage.**

## **HEALTH EFFECTS OF OXIDES OF NITROGEN:**

**Low levels of oxides of nitrogen can irritate the eyes, nose, throat and lungs, possibly leading to coughing, shortness of breath, tiredness and nausea. Exposure can also result in a buildup of fluid in the lungs for 1-2 days after exposure.**

Breathing high levels of oxides of nitrogen can cause rapid burning, spasms and swelling of tissues in the throat and upper respiratory tract, reduced oxygenation of tissues, a buildup of fluid in the lungs, and maybe even death.<sup>37</sup>

## **HEALTH EFFECTS OF HYDROCHLORIC ACID:**

Exposure to concentrated hydrochloric acid can cause circulatory collapse, which may lead to death; it can also cause death by asphyxia due to glottic oedema.

**Less concentrated solutions, can also cause conjunctivitis and corneal burns, inflammation and ulceration of the respiratory tract, dermatitis, skin burns, rhinitis, laryngitis, tracheitis, bronchitis, pulmonary oedema, dental erosion, hoarseness, a feeling of suffocation, nausea, vomiting, abdominal pain, diarrhoea, dehydration, convulsions, oliguria, hypotension, chills, shock, lethargy, stupor, permanent visual damage, cough, and choking.** Ingestion or skin contact with hydrochloric acid can cause corrosion of mucous membranes of the mouth, throat, and oesophagus, with immediate pain and dysphagia; it can also cause gastric haemorrhage and intense thirst.<sup>38</sup>

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<sup>35</sup> Australian Government Department of the Environment 2015, National Pollutant Inventory 'Substance Fact Sheets'.

<sup>36</sup> Ibid.

<sup>37</sup> Ibid.

<sup>38</sup> Australian Government Department of the Environment 2015, National Pollutant Inventory.

"AGL recognises that our future success and reputational standing is also shaped and measured by the social and environmental consequences our decisions and actions have for all our stakeholders."<sup>39</sup>

AGL Website

"A spokeswoman said...AGL "remains the leading private investor in renewables in Australia, having invested over \$3 billion in renewable energy generation."<sup>40</sup>

Sydney Morning Herald  
21 Aug 2014

"AGL is one of Australia's leading integrated energy companies and largest ASX listed owner, operator and developer of renewable energy generation in the country."<sup>41</sup>

AGL Website

Following its takeover of the previously government-owned Macquarie Generation coal-fired power generation assets, AGL is now Australia's biggest carbon emitter. Its largest fossil fuel power generators are the Bayswater and Liddell Power Stations, both in New South Wales, and the Loy Yang A Power Station in Victoria.

AGL promotes itself as an "integrated" power company, but in reality the majority of its power comes from coal.<sup>42</sup>

## HOW DOES AGL GENERATE ELECTRICITY?

AGL has made several purchases of coal-fired electricity generation assets in recent years, significantly shifting its business model to one that is dominated by coal-fired electricity generation.

AGL's electricity production capacity is dominated by fossil fuels, with coal providing the largest share at 64%, oil and gas at 19% and renewable energy the remaining 17%. Most of AGL's renewable energy projects are in Victoria and South Australia, while AGL's significant gas projects are mostly located in Queensland.

AGL's electricity generation is currently 81% from coal, 7% gas and 11% renewable energy.

<sup>39</sup> <http://www.agl.com.au/about-agl/what-we-stand-for/sustainability>

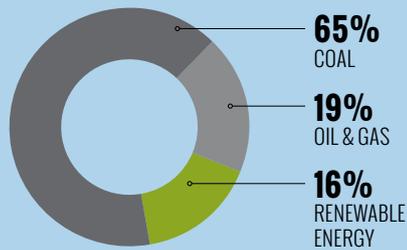
<sup>40</sup> Green guide ranks big energy providers in the red, Sydney Morning Herald, August 21, 2014

<sup>41</sup> <http://www.agl.com.au/about-agl/what-we-stand-for>

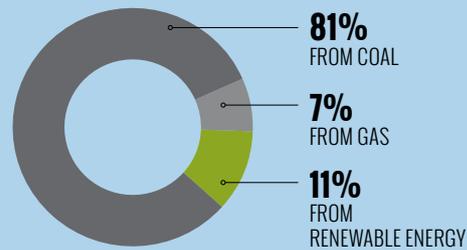
<sup>42</sup> "AGL is one of Australia's leading integrated energy companies": AGL's website <<http://www.agl.com.au/about-agl/who-we-are/our-company>>.

<sup>43</sup> Market Forces 2015, Research Briefing: AGL.

### AGL'S ELECTRICITY PRODUCTION CAPACITY<sup>1</sup>



### AGL'S ELECTRICITY GENERATION<sup>1</sup>



<sup>1</sup>Market Forces <http://www.marketforces.org.au/wp-content/uploads/2015/03/MFRB-AGL.pdf>

## HOW BIG ARE AGL'S CARBON EMISSIONS?

**Following its acquisition of Macquarie Generation in 2014, AGL is now the biggest greenhouse gas polluter in Australia.**

AGL's annual coal-fired electricity emissions alone amount to over 40 million tonnes per year. And Market Forces forecast that the carbon emissions from AGL's electricity generation are likely to rise steeply as the full impact of its acquisition of Macquarie Generation is realised.

In 2013-14, AGL's recorded carbon emissions were 19,928,540 tonnes CO<sub>2</sub> e (19,622,185 scope 1 emissions + 306,355 scope 2 emissions).<sup>44</sup> Scope 1 emissions are greenhouse gases resulting directly from an activity at a facility (or machine) owned by a company, for example, the emissions resulting from fuel combustion within a power station. Scope 2 emissions are greenhouse gases associated with energy consumption by a facility, for example, the greenhouse gases associated with the purchase of electricity.

Nearly all AGL's pollution comes from burning coal to generate energy. In 2013-14, 94 percent of AGL's reported facility level greenhouse gas emissions, was generated from just one power station: the brown coal-fired Loy Yang A in Victoria.

However in 2014 AGL acquired Macquarie Generation from the NSW government. In 2013-14 the total carbon emissions from Macquarie Generation was 20,373,569 tonnes CO<sub>2</sub> e (20,171,437 scope 1 emissions + 202,132 scope 2 emissions). Nearly all Macquarie Generation's greenhouse gas pollution came from burning coal to generate energy at their Bayswater and Liddell black-coal-fired power stations in NSW.

AGL's total carbon emissions in 2013-14 were in excess of 40,000,000 tonnes CO<sub>2</sub> e: 7.5% of Australia's total carbon emissions.



CARBON EMISSIONS FROM ELECTRICITY GENERATION:  
**40 302 109**  
TONNES OF CO<sub>2</sub><sup>2</sup>

<sup>2</sup>ACF Top Ten Polluters report  
[https://www.acfonline.org.au/sites/default/files/resources/ACF\\_Biggest\\_Polluters\\_Report\\_FINAL\\_V1.2.pdf](https://www.acfonline.org.au/sites/default/files/resources/ACF_Biggest_Polluters_Report_FINAL_V1.2.pdf)

<sup>44</sup> Australian Conservation Foundation 2015, Australia's Top 10 Climate Polluters.

## WHAT IS AGL'S POSITION ON RENEWABLE ENERGY?

**AGL has been lobbying against the Renewable Energy Target.** In its submission to the Department of the Prime Minister and Cabinet's 2014 review of the Renewable Energy Target it said: "There is little point continuing with higher targets for the [Large-scale Renewable Energy Target] in the future if the underlying economic fundamentals prevent investment in new renewable capacity."<sup>45</sup>

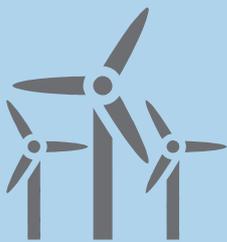
On Thursday 7th July 2014, AGL said that the repeal of the carbon price and a reduction in the Renewable Energy Target would benefit its Loy Yang dirty power station.

"While the removal of the carbon tax and associated transitional assistance has a negative impact on the short term earnings of the Loy Yang A power station, it has a materially positive impact on its long term value," it said in a statement to the ASX.

The statement added: "Any reduction in the Renewable Energy Target would also have a positive impact on the value of Loy Yang A."<sup>46</sup>

## HOW MUCH MONEY DOES AGL MAKE FROM RENEWABLES?

Market Forces estimates that the proportion of AGL's revenue derived from renewable energy is under 8% for the first half of the 2015 financial year and will remain well under this number for the full 2015 financial year.<sup>47</sup>



PROPORTION OF REVENUE DERIVED FROM RENEWABLE ENERGY:  
**LESS THAN 8%<sup>1</sup>**

<sup>1</sup>Market Forces <http://www.marketforces.org.au/wp-content/uploads/2015/03/MFRB-AGL.pdf>

On this basis, it is our view that if ever AGL were able to reasonably claim that they are a renewable energy company, it is certainly not now. Renewable energy has always made up a minority of AGL's power generation assets and this proportion has shrunk in the past year as the company has increased its coal-fired electricity generation.

<sup>45</sup> Australian Conservation Foundation 2015, Australia's Top 10 Climate Polluters.

<sup>46</sup> AGL 2014, FY14 Underlying Profit and FY15 Outlook Update, 17 July.

<sup>47</sup> Market Forces 2015, Research Brief: AGL.

# ENERGY AUSTRALIA

## WHAT ENERGIAUSTRALIA SAYS:

“EnergyAustralia strongly supports a Renewable Energy Target that will deliver 20 percent of Australia’s total electricity from renewable sources by 2020. We have backed over \$450 million in renewables programmes including wind farms and solar as well as selling solar panels and helping customers to reduce their energy use and carbon emissions.”<sup>48</sup>

Energy Australia Website

“EnergyAustralia is committed the principles of sustainable development and environmental stewardship. We aim to manage our operations and associated activities responsibly and in a sustainable manner.”<sup>49</sup>

Energy Australia Website

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EnergyAustralia is Australia’s third largest energy company, and draws almost all of its energy from burning coal.

**In August, 2014 Greenpeace and Total Environment Centre’s Green Electricity Guide rated it the second worst power company in Australia.**

### HOW DOES ENERGIAUSTRALIA GENERATE ELECTRICITY?

EnergyAustralia’s renewable electricity generation capacity is 177 Megawatts, or just 3.43% of the company’s overall portfolio. Coal (its Mount Piper, Wallerawang and Yallourn power stations) makes up 66% of EnergyAustralia’s generating capacity and gas another 31%. Mount Piper, Wallerawang and Yallourn power stations are part owned by EnergyAustralia.

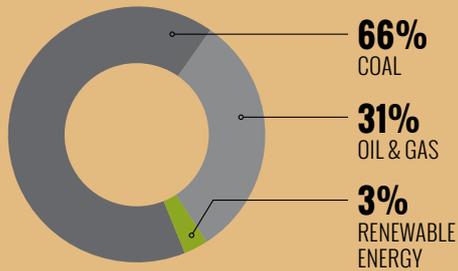
**Just 1.96% of electricity produced by EnergyAustralia-owned generators was from renewable energy in 2013, with 86% from coal and almost 13% from gas.**

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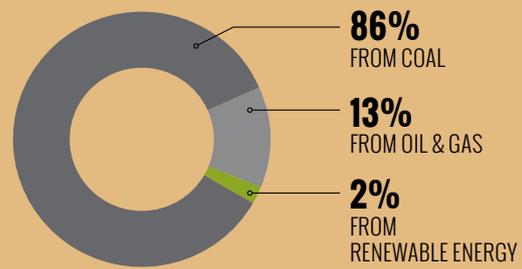
<sup>48</sup> <http://www.energyaustralia.com.au/about-us/what-we-do/clean-renewable-energy/climate-change>

<sup>49</sup> <http://www.energyaustralia.com.au/about-us/what-we-do/sustainability/environment>

## ENERGY AUSTRALIA'S ELECTRICITY PRODUCTION CAPACITY<sup>1</sup>



## ENERGY AUSTRALIA'S ELECTRICITY GENERATION<sup>1</sup>



1. Market Forces <http://www.marketforces.org.au/wp-content/uploads/2015/03/MFRB-Energy-Australia.pdf>

## HOW BIG ARE ENERGY AUSTRALIA'S CARBON EMISSIONS?

EnergyAustralia's total carbon emissions in 2013-14 were **20,810,266 tonnes CO<sub>2</sub>e**: **3.9% of Australia's total carbon emissions**.<sup>50</sup> Nearly all EnergyAustralia's greenhouse pollution comes from burning coal to generate energy.

In 2013-14, nearly 18 million tonnes of CO<sub>2</sub>e or 85 percent of EnergyAustralia's reported facility level greenhouse gas emissions came from just two power stations: the brown coal-fired Yallourn power station in Victoria and black-coal-fired Mount Piper in NSW.<sup>51</sup>



## CARBON EMISSIONS FROM ELECTRICITY GENERATION:

**20 810 266**  
TONNES OF CO<sub>2</sub><sup>2</sup>

2. ACF Top Ten Polluters report  
[https://www.acfonline.org.au/sites/default/files/resources/ACF\\_Biggest\\_Polluters\\_Report\\_FINAL\\_V1.2.pdf](https://www.acfonline.org.au/sites/default/files/resources/ACF_Biggest_Polluters_Report_FINAL_V1.2.pdf)

<sup>50</sup> Market Forces 2015, Research Briefing: EnergyAustralia.

<sup>51</sup> Australian Conservation Foundation 2015, Australia's Top 10 Climate Polluters.

## WHAT IS ENERGYAUSTRALIA'S POSITION ON RENEWABLE ENERGY?

**EnergyAustralia has been lobbying against the Renewable Energy Target and welcomed the repeal of the Carbon Tax.** In the 2014 interim report of its parent company, Hong Kong owned China Light and Power Holdings it said: "Longer term, this change (repealing the carbon price) should enhance returns from our low-cost base-load power stations."

And in its submission to the Prime Minister and Cabinet's 2014 review of the Renewable Energy Target it said: "In our view recalibration of the RET to equate to the original '20 percent by 2020' policy commitment is the most balanced approach to addressing the problem for all stakeholder groups."<sup>52</sup>

## HOW MUCH MONEY DOES ENERGYAUSTRALIA MAKE FROM RENEWABLES?

Market Forces estimate that 1.67% (or one-sixtieth) of EnergyAustralia's domestic revenue is derived from its renewable energy operations.<sup>53</sup>



PROPORTION OF REVENUE DERIVED FROM RENEWABLE ENERGY:

**1.67%**<sup>1</sup>

1. Market Forces

<http://www.marketforces.org.au/wp-content/uploads/2015/03/MFRB-Energy-Australia.pdf>

<sup>52</sup> Australian Conservation Foundation 2015, Australia's Top 10 Climate Polluters.

<sup>53</sup> Market Forces 2015, Research Briefing: EnergyAustralia.

# ORIGIN ENERGY

## WHAT ORIGIN SAYS:

“At Origin, we believe that energy needs to be provided reliably, at an affordable cost and in an environmentally responsible way. We understand our duty of care to those in the communities in which we operate. Origin maintains its long-term support of measures to progressively reduce carbon emissions.”<sup>54</sup>

Grant King, Origin Managing Director

“An Origin spokesman said the company was Australia’s biggest provider of green energy and had 10 times as many GreenPower customers as any other energy retailer. “We’re big supporters of the renewable energy target (RET) and have explicitly called for the scheme not to be abolished”<sup>55</sup>

Sydney Morning Herald, 21 Aug 2014

Origin Energy is Australia’s largest electricity retailer.<sup>56</sup> In August, 2014 Greenpeace and Total Environment Centre’s Green Electricity Guide rated it the third worst power company in Australia.

**While 4.4% of the company’s power generating capacity is attributed to renewable sources, just 1% of the 2014 financial year’s output came from them.** One of the company’s biggest source of emissions is the Eraring coal-fired power plant in New South Wales.

## HOW DOES ORIGIN GENERATE ELECTRICITY?

Origin’s two renewable energy power generation assets have a combined capacity of 270 megawatts, or just 4.4% of Origin’s generating portfolio. The Eraring coal-fired power plant accounts for 47% of Origin’s generation portfolio, with gas generators making up 42% of generating capacity.<sup>57</sup>

The share of electricity produced by renewables amongst Origin’s electricity generating assets has fallen to less than 1% in the financial year ending June 2014.<sup>58</sup>

<sup>54</sup> <http://www.originenergy.com.au/sustainability/message-our-managing-director>

<sup>55</sup> Green guide ranks big energy providers in the red, Sydney Morning Herald, August 21, 2014

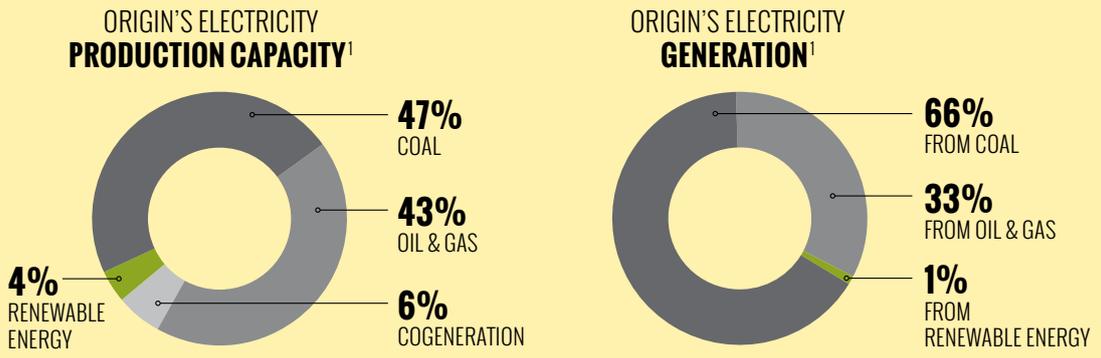
<sup>56</sup> Australian Energy Regulator State of the Energy Market Report 2014.

<sup>57</sup> Market Forces, Research Briefing: Origin.

<sup>58</sup> Ibid

Origin Energy is aggressively expanding gas operations, in particular the Australia Pacific Liquefied Natural Gas plant, which is commencing operations in 2015 and will feed and compress coal seam gas into Liquefied Natural Gas (LNG) for export.<sup>59</sup>

Origin has recently made a major play into the LNG market, as part owner of the APLNG project. This is due to commence producing LNG from coal seam gas for export in late 2015 and is likely to significantly alter Origin's balance sheet, further reducing the role of renewable energy as part of its overall business and revenue.<sup>60</sup>



1. Market Forces  
<http://www.marketforces.org.au/wp-content/uploads/2015/03/MFRB-Origin.pdf>

## HOW BIG ARE ORIGIN'S CARBON EMISSIONS?

Origin Energy's total carbon emissions in in 2013-14 were 12,737,691 tonnes CO2 e: 2.4% of Australia's total carbon emissions.<sup>61</sup>

Nearly all Origin's greenhouse gas pollution comes from burning coal to generate energy. In 2013-14, 10.6 million tonnes of CO2 e, or 79 percent of Origin's reported facility level greenhouse pollution, came from just one power station, the black-coal-fired Eraring station in NSW.



CARBON EMISSIONS FROM ELECTRICITY GENERATION:  
**12 737 691**  
 TONNES OF CO2<sup>2</sup>

2. ACF Top Ten Polluters report  
[https://www.acfonline.org.au/sites/default/files/resources/ACF\\_Biggest\\_Polluters\\_Report\\_FINAL\\_V1.2.pdf](https://www.acfonline.org.au/sites/default/files/resources/ACF_Biggest_Polluters_Report_FINAL_V1.2.pdf)

<sup>59</sup> Market Forces, Research Briefing: Origin.  
<sup>60</sup> Ibid  
<sup>61</sup> Market Forces 2015, Research Briefing: Origin.

## WHAT IS ORIGIN'S POSITION ON RENEWABLE ENERGY?

Origin has argued it supports the RET, saying "We have been (and continue to be) long-term supporters of the RET as a key component of Australia's policy response to climate change."<sup>62</sup> In its submission to the Prime Minister and Cabinet's 2014 Review of the Renewable Energy Target, it said: "Origin supports...a return to one RET scheme...re-set the target to the original 20 percent" (effectively a cut of two thirds to the target).<sup>63</sup>

In a presentation to the Macquarie Australia conference in Sydney back in 2012, Origin called for "a RET based on 20 percent of actual demand, which it expected would only require enough large-scale renewable energy projects built to generate 27TWh of electricity (down from 41TWh)."<sup>64</sup>

## HOW MUCH MONEY DOES ORIGIN MAKE FROM RENEWABLES?

Market Forces estimate that 0.6% of Origin's FY2014 revenue was sourced from renewable energy generation. This figure has declined from just over 1%, "seemingly due to reduced production at the Shoalhaven Hydro plant."<sup>65</sup>



PROPORTION OF REVENUE DERIVED FROM RENEWABLE ENERGY:  
**LESS THAN 1%**<sup>1</sup>

1. Market Forces  
<http://www.marketforces.org.au/wp-content/uploads/2015/03/MFRB-Origin.pdf>

<sup>62</sup> <http://www.originenergy.com.au/4566/Origin-and-the-renewable-energy-target>

<sup>63</sup> Australian Conservation Foundation 2015, Australia's Top 10 Climate Polluters.

<sup>64</sup> Sydney Morning Herald 2012, Origin Energy Attacks Renewable Energy Target", 2 May.

<sup>65</sup> Market Forces 2015, Research Briefing: Origin.

# CONCLUSION

The levels of carbon emissions and toxic air pollution produced by the “Dirty Three’s” dirty power stations are alarming.

The information in this report is even more worrying because while these companies continue to claim they support cleaner energy and are committed to lowering carbon emissions and protecting the environment they are lobbying against the Renewable Energy Target to support their investments in dirty power. And they are doing little or nothing to tackle their toxic pollution outputs. Unfortunately for Australia the most recent data from the National Pollutant Inventory shows the reality is the “Dirty Three” really are living up to their name.

The vast majority of Australians support renewable energy but when over 70% buy their electricity from AGL, EnergyAustralia and Origin it’s disappointing but perhaps no surprise that the “Dirty Three” aren’t listening to their customers.

The types of toxic emissions reported to come from the “Dirty Three’s” power plants are associated with increased rates of chronic and acute health conditions, particularly in children and the elderly, and people with existing respiratory and cardiovascular ailments. These illnesses include asthma and lung cancer.<sup>66</sup>

Instead of doing what their websites, advertising and public statements suggest by supporting renewable energy policy and taking action to cut carbon emissions and toxic pollution, the “Dirty Three” are increasing their investments in coal-fired power and lobbying against important policy like the Renewable Energy Target to try to protect those dirty investments.

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<sup>66</sup> Climate and Health Alliance 2013, Submission to Senate Standing Committees Community Affairs, Inquiry into the Impacts of Health of Air Quality in Australia.

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