# Is Australia on Track with Emissions?

**Hook**  
Imagine a future where bushfires burn hotter, floods strike harder, and the Great Barrier Reef fades into memory. That future is not far — unless we act.

**Setting**  
Climate change is no longer a distant threat; it is today’s challenge. In 2015, the Paris Agreement united nations in a race against time, committing to limit global warming to well below 2°C—ideally 1.5°C.

**Main Character**  
Australia, though home to just 0.3% of the global population, ranks among the top per-capita carbon emitters in the world. Our role, therefore, is small in size—but large in impact.

**Conflict**  
The question is: **Are we on track to meet our Paris targets by 2030 and net-zero by 2050?** The answer lies in the data.

## Visual 1: Australia’s Emissions Trend (1990–2023) vs 2030 & 2050 Targets

**Source**: [Greenhouse Gas Inventory](https://www.greenhouseaccounts.climatechange.gov.au/)  
**Line graph**: shows Australia’s historical emissions, current trajectory, and overlayed Paris targets.  
**It sets the scene for urgency:** As you can see, while emissions have declined since 2005, the pace is not yet fast enough for our 2030 target: a **43% cut from 2005 levels**.

82% renewable electricity by 2030

Net-zero emissions by 2050

Visual 2: Sector-wise Emissions Breakdown (Energy, Agriculture, Transport, etc.)

**Source**: [Australian Greenhouse Emissions Data](https://www.greenhouseaccounts.climatechange.gov.au/)  
**Stacked bar chart**: highlights where emissions come from.  
**It's not just energy** — agriculture and transport are major contributors too.

Transitioning to renewables is critical, but we also need systemic change across multiple sectors.

**Theme:** Clean energy is Australia’s opportunity—not just a responsibility. Across our states and territories, some are leading the way. Others are falling behind.

Visual 3: Renewable Energy Share by State/Territory (2023)

**Source**: Australian Energy Statistics  
**Bar graph**: comparing renewables' share in total electricity generation.  
Shows Tasmania (100%) and ACT (100%) vs NSW, WA, NT lagging.

This reveals a stark divide. Leadership exists—so does potential for improvement.

Visual 4: Per Capita Solar Uptake by State

**Source**: [Clean Energy Regulator](https://www.cleanenergyregulator.gov.au)  
**Map or bar chart** showing residential solar penetration.  
Great for engaging citizens directly.

More than 1 in 3 homes in South Australia have rooftop solar—proof that individuals can lead change.

Visual 5: Historical Grid Emissions Intensity (gCO₂/kWh)

**Source**: Australian Energy Statistics – Table O  
**Line chart** showing decarbonization of Australia’s electricity grid.  
Indicates clean energy impact over time.

Renewables have nearly halved grid emissions in some regions—but national consistency is lacking.

**Data as Drama**  
Progress exists, but it’s uneven. And uneven progress means a shared future is still at risk.

Here's a detailed explanation of the data source and insights related to the **Historical Grid Emissions Intensity (gCO₂/kWh)** in Australia:

**Understanding Grid Emissions Intensity**

**Grid emissions intensity** measures the amount of carbon dioxide (CO₂) emitted per kilowatt-hour (kWh) of electricity generated. It's a crucial metric for assessing the environmental impact of electricity production and tracking progress toward decarbonization goals.

**Data Source: Australian Energy Statistics – Table O**

The primary source for this data is the **Australian Energy Statistics**, specifically **Table O**, published by the Department of Climate Change, Energy, the Environment and Water (DCCEEW).

**Table O** provides comprehensive data on electricity generation by fuel type across Australian states and territories. It includes:

* **Total electricity generation** figures.
* **Breakdown by fuel type** (e.g., coal, gas, solar, wind, hydro).
* **State and territory-specific data**.

This dataset is updated annually and forms the basis for analyzing trends in electricity generation and associated emissions.

**Calculating Emissions Intensity**

While Table O provides data on electricity generation by fuel type, emissions intensity is calculated by combining this with emissions data from the **National Greenhouse Gas Inventory (NGGI)**. The formula is:

**Emissions Intensity (gCO₂/kWh) = (Total CO₂ Emissions from Electricity Generation / Total Electricity Generated) × 1,000**

This calculation yields the grams of CO₂ emitted per kilowatt-hour of electricity produced.

**Trends in Australia's Grid Emissions Intensity**

Over the past two decades, Australia has made significant strides in reducing grid emissions intensity:

* **National Decline**: Emissions from the electricity sector decreased from approximately 55 million tonnes per quarter in September 2008 to 34.6 million tonnes per quarter by December 2022. This reduction occurred despite population growth from 20 million in 2004 to nearly 27 million by the end of 2023 .
* **Renewable Energy Uptake**: The share of renewable energy in Australia's electricity supply reached a record 46% in the December 2024 quarter, with coal-fired generation falling below 50% for the first time .

**State-Level Disparities**

While national trends show improvement, emissions intensity varies across states:

* **Victoria**: Despite efforts, Victoria's grid remains the most carbon-intensive due to its reliance on brown coal. In 2023, its electricity emissions factor was 0.85 kg CO₂e/kWh, higher than New South Wales' 0.82 kg CO₂e/kWh five years earlier .
* **Tasmania and ACT**: These regions have achieved near or complete renewable electricity generation, resulting in significantly lower emissions intensity.

**Data as Drama: Uneven Progress**

The data tells a compelling story:

* **Progress Exists**: Nationally, there's a clear trend toward reduced emissions intensity, driven by renewable energy adoption.
* **Challenges Remain**: Some states lag due to continued dependence on fossil fuels, highlighting the need for targeted policies and investments.

This uneven progress underscores the importance of continued efforts to achieve consistent decarbonization across all regions.

**Accessing and Preparing the Data**

For your visualization portfolio:

1. **Download Table O**: Access the latest Australian Energy Statistics – Table O.
2. **Obtain Emissions Data**: Retrieve corresponding emissions data from the National Greenhouse Gas Inventory.
3. **Calculate Emissions Intensity**: Use the formula provided above to compute emissions intensity for each state and year.
4. **Visualize Trends**: Create line charts to depict the decarbonization trajectory of Australia's electricity grid over time.

If you need assistance with data preparation or visualization in Tableau, feel free to ask!

Visual 6: Projected Path (with Current Policy vs Required Path)

**Source**: [Climate Action Tracker – Australia](https://climateactiontracker.org/)  
A forward-looking chart comparing current trajectory with Paris-aligned scenario.  
Drives home the gap.

If we continue on our current course, we overshoot the target. New policies must be bolder.

Visual 7 (optional): Global Comparison – Emissions per Capita

**Source**: Our World in Data  
**Bar chart** comparing Australia to EU, China, US, India  
Shows high emissions per Australian.

We can’t afford to wait for others. Leadership starts at home.

**Emotional/Ethical Appeal**  
This isn’t just about numbers. It’s about protecting what we love—our ecosystems, coastlines, and communities. And ensuring that future Australians inherit a livable planet.

**Ending (Call to Action)**  
Citizens can act—by choosing green energy plans, installing solar, or supporting clean transport.  
Policymakers must act—by investing in renewables, modernizing our grid, and rebalancing subsidies.  
Let’s make climate data not just informative—but transformative.  
Because the future we want depends on the choices we make today.

## Recommended Visualizations Recap:

| **#** | **Visualization** | **Data Source** |
| --- | --- | --- |
| 1 | Emissions trend vs 2030/2050 targets | greenhouseaccounts.climatechange.gov.au |
| 2 | Sectoral emissions breakdown | greenhouseaccounts.climatechange.gov.au |
| 3 | State-level renewable energy share | energy.gov.au |
| 4 | Rooftop solar uptake by state | cleanenergyregulator.gov.au |
| 5 | Emissions intensity of electricity | energy.gov.au |
| 6 | Current vs Required Emission Path | climateactiontracker.org |
| 7 | Global per capita comparison (optional) | ourworldindata.org |

## PowerPoint design help for the visuals

A narrated audio script - Data download and prep (e.g., clean CSVs for Tableau) - generate a storyboard layout too

**PowerPoint Design Assistance for Visuals**

To create compelling visuals for your presentation, consider the following design tips:

1. **Slide 1: Emissions Trend vs. Targets**
   * **Visualization**: Line chart showcasing Australia's emissions from 1990 to 2023, with overlayed lines indicating 2030 and 2050 Paris Agreement targets.
   * **Design Tip**: Use contrasting colors for actual emissions and target lines to emphasize the gap.
2. **Slide 2: Sectoral Emissions Breakdown**
   * **Visualization**: Stacked bar chart displaying emissions by sector (Energy, Agriculture, Transport, etc.).
   * **Design Tip**: Assign distinct colors to each sector and include a legend for clarity.
3. **Slide 3: Renewable Energy Share by State**
   * **Visualization**: Bar chart comparing renewable energy percentages across states and territories.
   * **Design Tip**: Highlight leading states like Tasmania and the ACT in green to signify progress.
4. **Slide 4: Rooftop Solar Uptake**
   * **Visualization**: Map of Australia illustrating per capita rooftop solar installations by state.
   * **Design Tip**: Use a gradient color scale to represent varying levels of adoption.
5. **Slide 5: Grid Emissions Intensity Over Time**
   * **Visualization**: Line graph showing the decline in emissions intensity (gCO₂/kWh) over the years.
   * **Design Tip**: Annotate significant policy changes or milestones that influenced the trend.
6. **Slide 6: Current vs. Required Emission Path**
   * **Visualization**: Dual-line chart comparing current emission trajectory with the required path to meet Paris targets.
   * **Design Tip**: Use dashed lines for projections and solid lines for actual data to differentiate.
7. **Slide 7: Global Per Capita Emissions Comparison**
   * **Visualization**: Horizontal bar chart comparing Australia's per capita emissions with other countries.
   * **Design Tip**: Position Australia prominently to draw attention to its standing.

**General Design Tips**:

* Maintain a consistent color palette throughout the presentation.
* Use high-contrast colors for text and backgrounds to ensure readability.
* Limit the amount of text on each slide; focus on visuals and key points.
* Incorporate icons or images where appropriate to enhance engagement.

## Narrated Audio Script

To complement your visuals, here's a concise audio script tailored to your 5-minute video:

**Slide 1**: "Australia's greenhouse gas emissions have seen fluctuations over the past decades. However, when we overlay our current trajectory against the Paris Agreement targets for 2030 and 2050, a concerning gap emerges."

**Slide 2**: "Breaking down emissions by sector reveals that energy production remains the largest contributor, followed by transport and agriculture. Addressing these sectors is crucial for meaningful reductions."

**Slide 3**: "Examining renewable energy adoption across states, Tasmania and the ACT lead with impressive percentages, showcasing the potential for nationwide progress."

**Slide 4**: "Rooftop solar installations have surged in states like South Australia, indicating a positive trend in individual contributions to clean energy."

**Slide 5**: "The emissions intensity of our electricity grid has decreased over time, reflecting the impact of renewable energy integration."

**Slide 6**: "However, projections indicate that without accelerated efforts, our current path falls short of the required reductions to meet international commitments."

**Slide 7**: "When comparing per capita emissions globally, Australia's figures remain high, underscoring the urgency for both policy and behavioral changes."

**Conclusion**: "Collective action from citizens and policymakers is essential. By embracing renewable energy, enhancing public transport, and implementing effective policies, Australia can align with the Paris Agreement and secure a sustainable future."

## Data Download and Preparation for Tableau

To facilitate your data visualization efforts in Tableau, consider the following steps:

1. **Data Sources**:
   * **Australian Greenhouse Gas Emissions**: Department of Climate Change, Energy, the Environment and Water
   * **Australian Energy Statistics**: energy.gov.au
   * **Clean Energy Regulator Data**: [cleanenergyregulator.gov.au](https://www.cleanenergyregulator.gov.au/)
   * **Climate Action Tracker**: climateactiontracker.org
   * **Our World in Data**: ourworldindata.org
2. **Data Preparation**:
   * **Format**: Ensure all datasets are in CSV format for compatibility with Tableau.
   * **Cleaning**: Remove any unnecessary columns, handle missing values, and standardize date formats.
   * **Merging**: If combining datasets, use common keys like 'Year' or 'State' to join them appropriately.
3. **Tableau Tips**:
   * Utilize calculated fields to derive metrics like emissions per capita.
   * Employ filters to allow interactive exploration by sector or state.
   * Use dashboards to present multiple visualizations cohesively.

## Storyboard Layout

A well-structured storyboard will guide your narrative effectively. Here's a suggested layout:

1. **Introduction**:
   * **Objective**: Set the context by highlighting the significance of climate change and Australia's role.
   * **Visual**: Emissions Trend vs. Targets chart.
2. **Current Emissions Landscape**:
   * **Objective**: Provide a snapshot of sectoral emissions.
   * **Visual**: Sectoral Emissions Breakdown chart.
3. **State-Level Renewable Adoption**:
   * **Objective**: Showcase disparities and progress among states.
   * **Visuals**: Renewable Energy Share by State and Rooftop Solar Uptake map.
4. **Progress Over Time**:
   * **Objective**: Illustrate improvements in grid emissions intensity.
   * **Visual**: Grid Emissions Intensity Over Time graph.
5. **Future Projections**:
   * **Objective**: Compare current trajectory with required targets.
   * **Visual**: Current vs. Required Emission Path chart.
6. **Global Context**:
   * **Objective**: Position Australia's emissions on a global scale.
   * **Visual**: Global Per Capita Emissions Comparison chart.
7. **Call to Action**:
   * **Objective**: Encourage actionable steps for both citizens and policymakers.
   * **Visual**: Summary slide with key takeaways and recommendations.

**Australia's Targets under the Paris Agreement**

**2030 Target**

* **Reduce greenhouse gas emissions by 43% below 2005 levels by 2030.**
* **Supplementary goal: 82% renewable electricity generation by 2030**

**2050 Target**

* **Net Zero Emissions by 2050**
* **Gross emissions (from human activity)** – **Removals (e.g., carbon offsets, afforestation, carbon capture)** = **0 net emissions**
* It does **not** mean zero emissions across the board, but that any emissions produced are counterbalanced by carbon sinks or offsets.
* In practice:
  + Phasing out fossil fuels
  + Electrifying transport and industry
  + Expanding renewable energy
  + Investing in carbon capture, storage, and nature-based solutions (like tree planting or restoring wetlands)

|  | **Target Description** |
| --- | --- |
| 2030 | 43% reduction in GHG emissions (from 2005 baseline) |
| 2030 | 82% renewable electricity generation |
| 2050 | Net Zero GHG Emissions |