

# Inquiry into the Response of Western Australian Schools to Climate Change



## **Introduction**

Climate Change Response is a Perth-based consultancy that I (Om Dubey) initiated over 10 years ago. I am passionate about everything Climate Change, particularly in WA where I have resided for nearly 30 years. I'm happy to see the Inquiry raised by the Parliament of Western Australia and below provide what insight I can, having worked in the industry for some time.

### **The co-benefits of climate action in schools**

Climate change is an issue for both the present and the future of humanity. The global response to combat climate change requires a steep change that is not only in industry, but in society as well. There is an ever-growing importance of our future generations to understand and appreciate their impact on the environment. By introducing topics related to climate change in schooling, society will be better equipped for a shift its mindset and more likely adopt practices and solutions that combat, and perhaps even reverse, the impacts of climate change.

### **Climate change mitigation and adaptation actions currently being undertaken in schools, and the benefits they are achieving**

While programs exist (or are being developed) in the consulting space to be provided to schools information on climate change via educational guest speakers for children, the adaptation of climate change topics into student curricula itself is not necessarily evident – more specifically in STEM courses. While tertiary education is developing to include courses such in renewable energy, sustainability, etc., provision of these topics to students in a secondary and primary schooling environment would better equip tomorrow's problem solvers with exposure to these critical topics from a formative age. This should flow into greater adoption of tertiary education related to climate change, and therefore better drive the development of commerce and business in this growing sector.

### **What more can be done to support schools to respond to climate change.**

Educational policy should adapt to drive inclusion of these topics in school curricula. Further, as the industry is relatively new and also a lot of solutions to sustainability and climate change issues are driven by technology (a rapidly changing field), it may be considered difficult to bring these topics into schools. However, the technology exists and our children would find benefit in exposure to it in the schooling environment. In turn, this may provide them the opportunity to explore passions (and even future careers) in sustainability and climate change, rather than be dependent on what they read on social media and the internet to formulate their opinions.

If schools were to adapt sustainable practices and technologies themselves, children would have greater exposure to these important issues. Attached is an example of a local, Perth-based technology provider, Arnova, that has studied how this use case may be approached. Arnova is a sister-company of Climate Change Response which aims to leverage technology to better address climate change and sustainability.

### **Actions considered by the Committee for school-based climate change mitigation and adaptation:**

There are technologies already available on the market that address climate change

mitigation actions raised by the committee. I have summarised only a few below, and attached supporting detail where relevant.

***Sustainability and Water***

Sustainable water practises with real-time water monitoring, alerts of over consumption / leakage, controlling and automating water usage to occur at times of minimal cost and minimal wastage (e.g. irrigation).

***Sustainability and Energy***

Utilisation of renewable energy and distributed energy resources (e.g. solar, wind, generators, battery technologies) and power management that reduce reliance on traditional fossil fuel fired industrial power plants. Tariff and consumption optimisation around peak- and off-peak periods.

***Transport***

Infrastructure that supports the utilisation of electric vehicles (charging infrastructure, batteries). Smart parking to make parking more efficient, reducing idling time and associated fuel wastage.

***Healthy and ecologically sustainable diet, biodiversity and green spaces***

Smart Agriculture / Farming practises that provide produce with a lower carbon footprint.

***Purchasing and Waste***

End-to-end goods tracking and supply chain optimisation to reduce fuel consumption and emissions. Utilisation of smart waste monitoring to understand real-time bin levels, plan emptying activities (reducing unnecessary trips and associated fuel consumption and emissions), and reduce visual and odour impact to pedestrians / passers-by.

***Built Environment***

conversion of existing infrastructure into “Smart” infrastructure to better source data, apply data analytics and dashboarding, drive more sustainable practices and better understand the benefits realized, and apply Artificial Intelligence and Machine Learning algorithms to data to better manage facilities by predicting maintenance requirements rather than reacting to failures.

I welcome any further discussion on the topic, and thank you for the opportunity to submit my thoughts.









## Video Analytics

Arnova's Video Analytics reforms obsolete CCTV surveillance systems, ensuring the security of students as well as opening the door to understanding other useful data. While CCTV is limited to live feed monitoring or review, Arnova's system takes a predictive and preventative approach. The surveillance platform interrogates live feed to extract useful information from simple videos. Real-time data is analysed to detect and distinguish a variety of parameters and anomalies. These include objects, speed, colours, people, vehicles, numbers, faces, and even behaviour. The platform flags parameters to enable purpose-driven review. Subjects can be identified and flagged at each appearance, drastically reducing analysis time. The fully integrated platform not only monitors and collects data but also provides users with knowledgeable and actionable insights to enhance security and management activities.

## Smart Parking

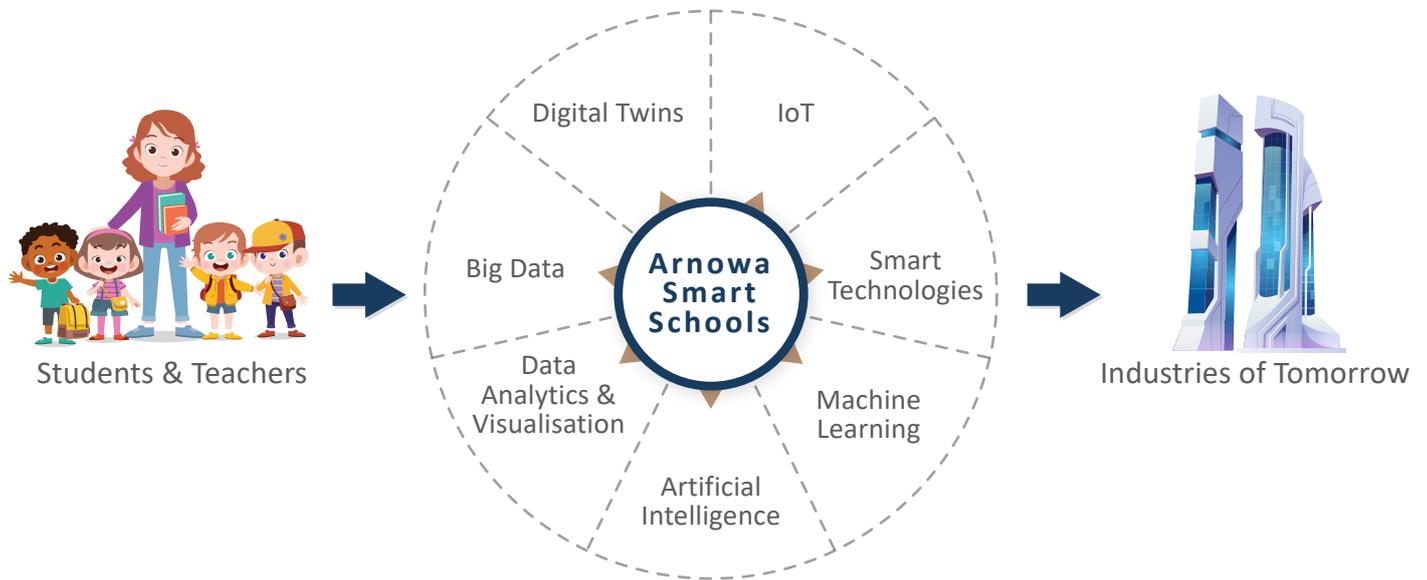
Navigating a school campus in peak traffic can be a nightmare and safety concern for pedestrians on the road. Arnova's Smart Parking leverages our Smart Video infrastructure to assist drivers through this daily challenge. The system produces real-time spatial occupancy maps and understands when occupants have left a vehicle. It tracks number plates, counts vehicles, and automates entry and exit points to optimise traffic flow at a pick-up/drop-off point. Smart Signage placed strategically throughout the area clearly alerts drivers when it is safe to park, depart, or approach. The system also allows a seamless parking experience in fixed parking lots. Occupancy maps (via Video Analytics or proximity sensors) and Smart Signage assist staff and visitors in navigating to the nearest available bays.



## Smart Waste Management

Poor waste collection and disposal practices often lead to environmental damage. Arnova's Smart Waste Management includes sensors that detect real-time fill volume, odour, and contamination. These sensors are retrofitted in existing bins or as standard supply in the Arnova Smart Bin. The Smart Bin offers the next generation of waste management. It is equipped with a solar-powered waste compactor to maximise fill, and even has People Counting and Alarming functionality. Each bin or sensor in Arnova's Smart Waste Management system is LoRa-enabled to wirelessly communicate with Carbon. The system optimises truck schedules to reduce unnecessary callouts and vehicle emissions. Custom alerts also ensure timely action to ensure a clean and hygienic environment for staff and students.

With a strong focus on enjoyable skill development and practical knowledge sharing, Arnowa's Smart School program helps students to be ready for the industries of tomorrow. With field experience using Smart technology-enabled devices, the program encourages students to investigate, collaborate, and innovate with IoT-enabled devices. The result is a fun, holistic, and most of all informative learning experience!



By collecting data first-hand, students understand how it provides the opportunity to analyse and contribute to decisions. The Smart School Program encourages analytical thinking to make students aware of how their surroundings function, and what parameters impact that function. The program broadens students' perspectives and knowledge of Smart technology devices, as well as their real-world applications and benefits. By gaining insight into what these technologies are capable of doing, students learn how to use these technologies to implement change.



## About Arnowa

Established in 2013, Arnowa is an Australian based smart technology development company which excels in designing, manufacturing and implementing smart city and industry 4.0 infrastructure. We provide solutions that simplify processes, spark efficiency, enable collaborative engagement and promote sustainability.

Our ecosystems acquire your undiscovered data in real-time and apply our diagnostic and predictive analytics. It's how we enable informed planning and management to produce true value, regardless of industry and size. Businesses who partner with Arnowa proprietary ecosystems are smarter, more efficient and more effective.

## Contact Us

✉ [contact@arnowa.com](mailto:contact@arnowa.com)  
🌐 [www.arnowa.com](http://www.arnowa.com)

### Australia

6/18 Blackly Row, Cockburn Central,  
Perth, Western Australia 6164

### India

B-379, Sector -19, Dwarka,  
New Delhi, India 110075

### Indonesia

Kedungdoro, 80 C Surabaya,  
Indonesia 60251

