

VUCA WORLD

VOLATILE. UNCERTAIN. COMPLEX. AMBIGUOUS

BANI WORLD

BRITTLE. ANXIOUS. NONLINEAR. INCOMPREHENSIBLE



TEAM ECHOVATION
PHILIPPINES



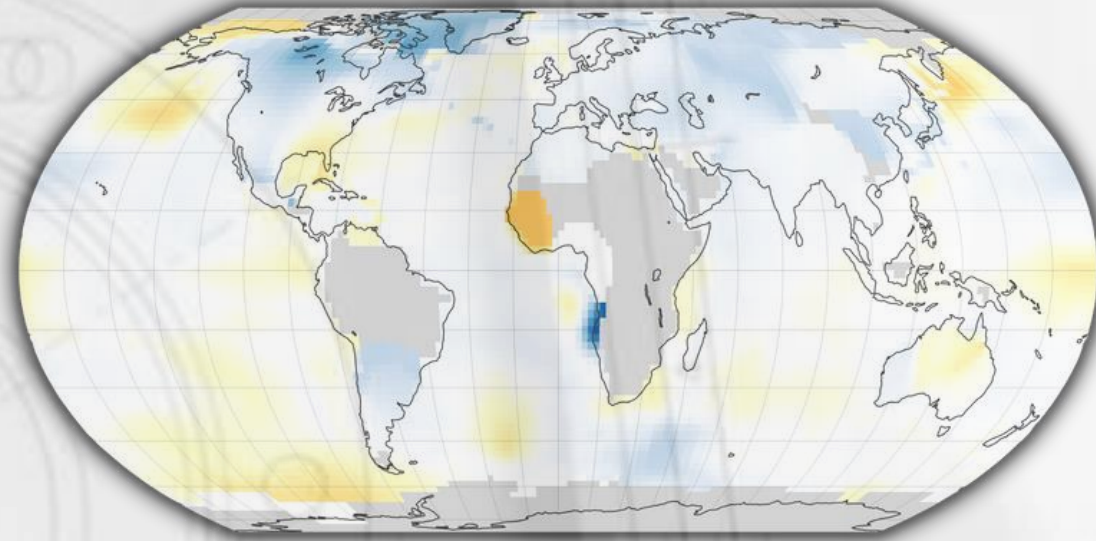
KILOMETER ZERO

AN AVENUE TOWARDS A GREENER AND SMARTER CITIES

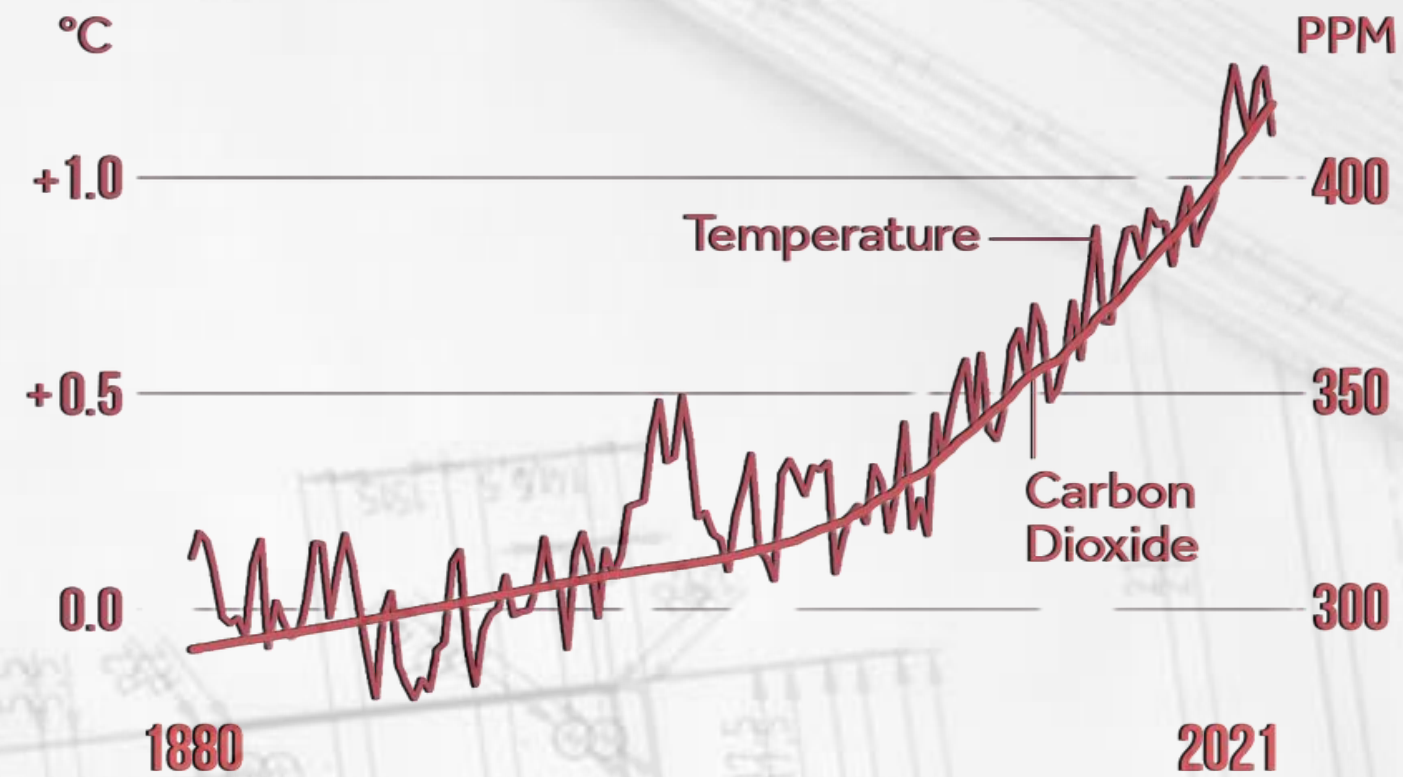
ENABLING GREENER MOBILITY THROUGH SUSTAINABLE TRANSPORTATION AND SMART TECHNOLOGY,
CARBONSMART IS THE STARTING POINT FOR TRANSFORMING CITIES FOR THE BETTER.

RHEYCEE CYRELL AGAPITO & JOSELLE ANN SUMERA
NUEVA ECIA UNIVERSITY OF SCIENCE AND TECHNOLOGY

1880-1884



TEMPERATURE & CARBON DIOXIDE

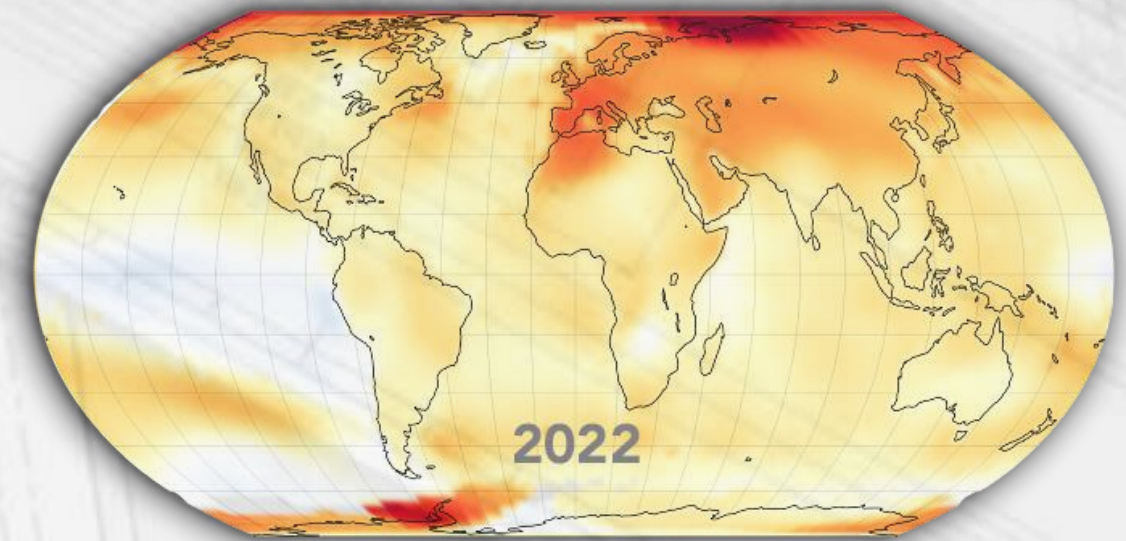


Global temperature anomalies averaged and adjusted to early industrial baseline (1881-1910)
Source: NASA GISS, NOAA NCEI, ESRL

CLIMATE CENTRAL

SOURCE: <https://www.climatecentral.org/climate-matters/peak-co2-heat-trapping-emissions>

2022

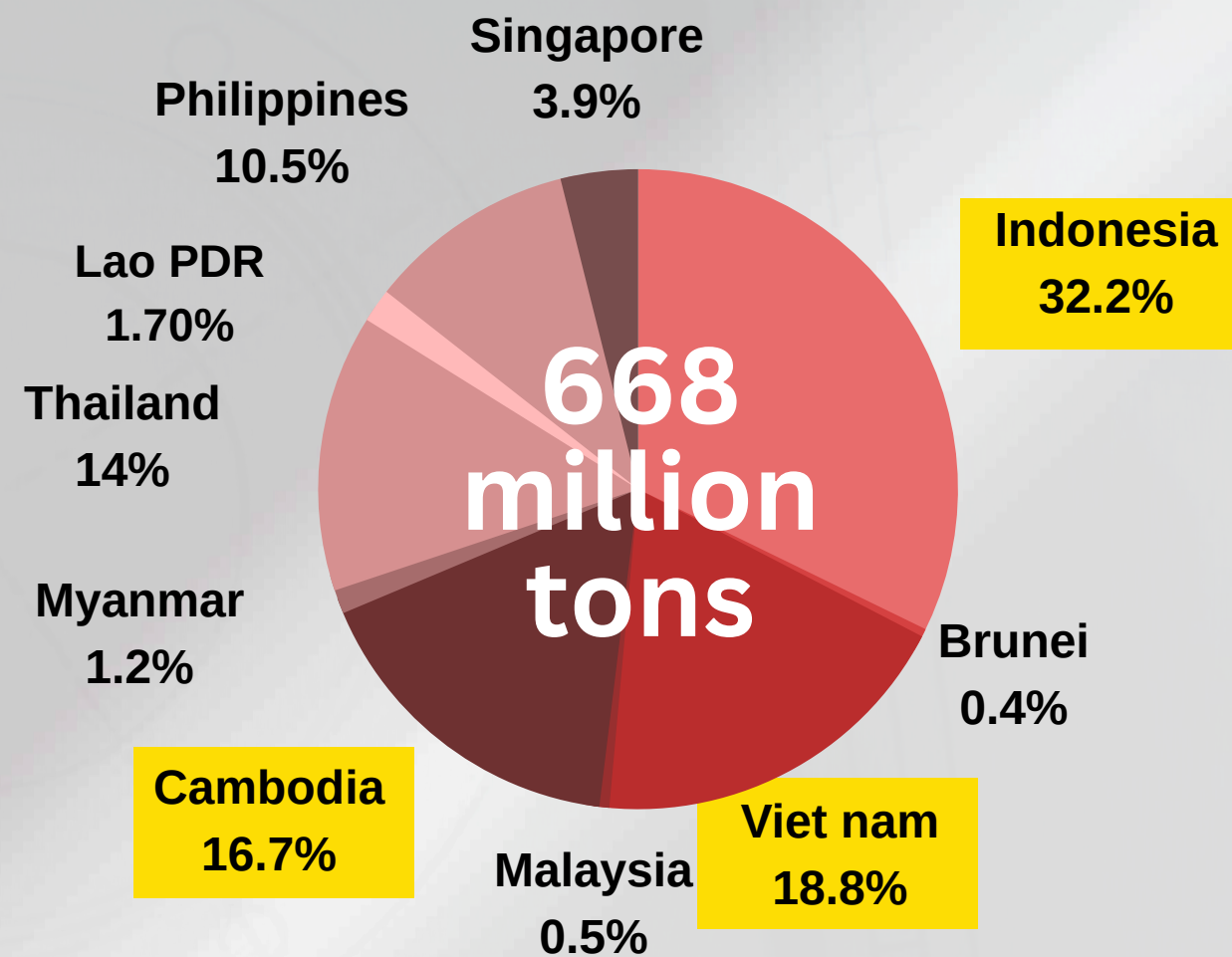


RISING GLOBAL TEMPERATURE OVER TIME SCORCHES OUR FRAGILE PLANET, LEAVING A SCAR THAT NONE CAN IGNORE

SOURCE: NASA Earth Observatory. (n.d.). World of Change: Global temperatures.
<https://earthobservatory.nasa.gov/world-of-change/global-temperatures/show-all>

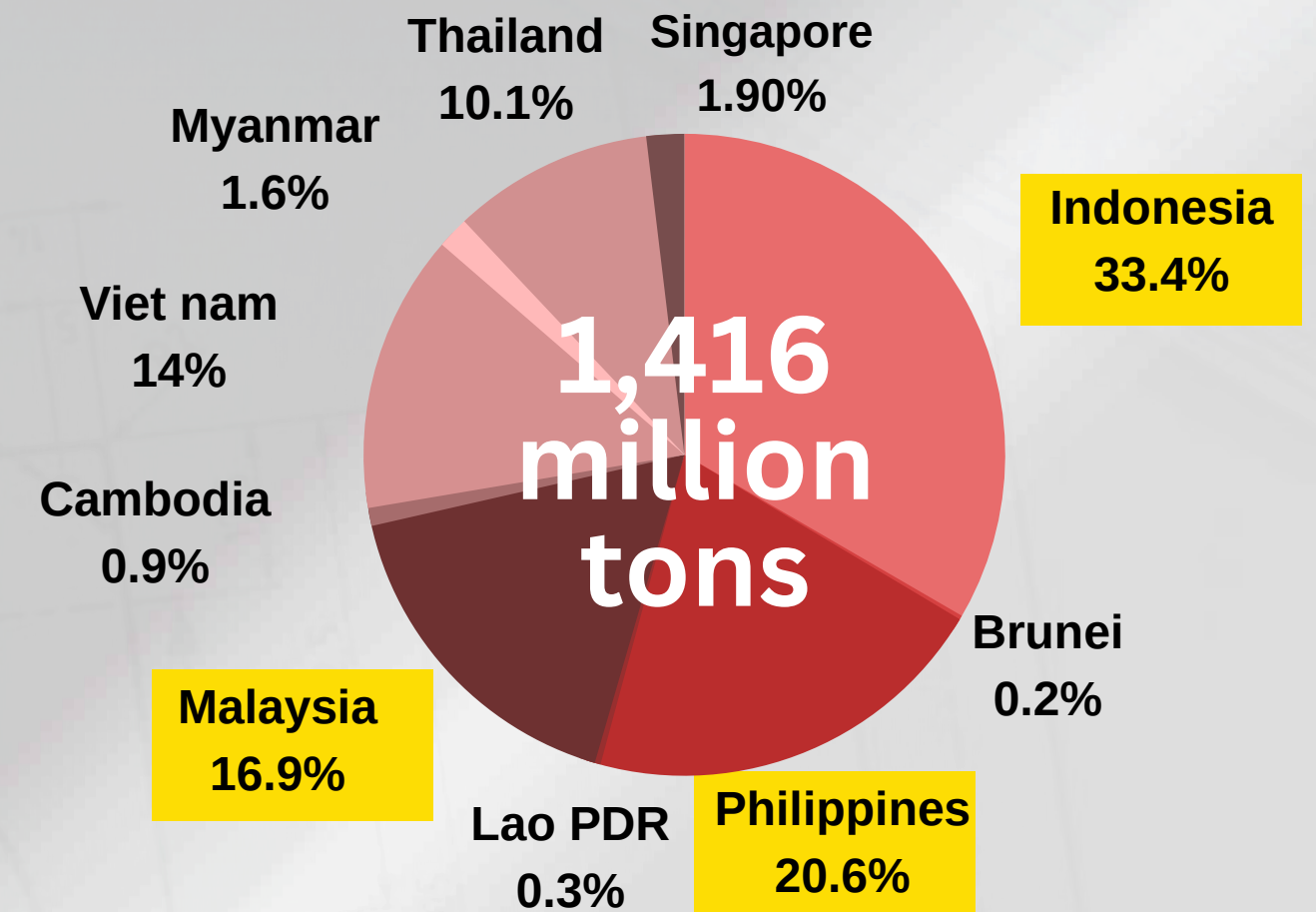


Share of Total GHG Emissions by Asean Member State 2020



SOURCE: Handayani, K., Anugrah, P., Goembira, F., Overland, I., Suryadi, B., & Swandaru, A. (2022). Moving beyond the NDCs: ASEAN pathways to a net-zero emissions power sector in 2050. Applied Energy, 311, 118580. <https://doi.org/10.1016/j.apenergy.2022.118580>

Share of Total GHG Emissions by Asean Member State 2050

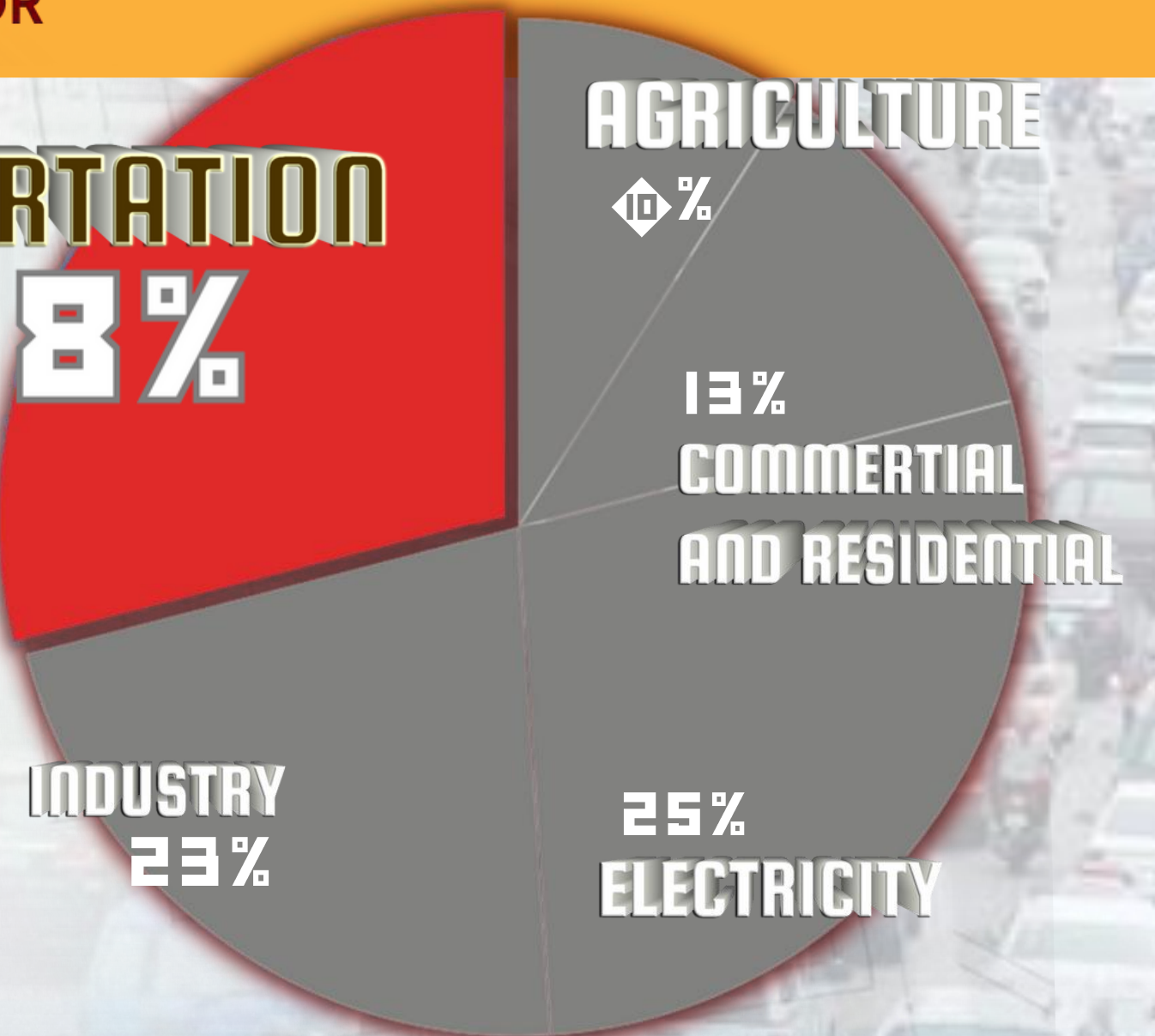


SOURCE: Handayani, K., Anugrah, P., Goembira, F., Overland, I., Suryadi, B., & Swandaru, A. (2022). Moving beyond the NDCs: ASEAN pathways to a net-zero emissions power sector in 2050. Applied Energy, 311, 118580. <https://doi.org/10.1016/j.apenergy.2022.118580>

GREENHOUSE GAS SOURCES UNITED STATES EMISSIONS BY SECTOR

TRANSPORTATION
28%

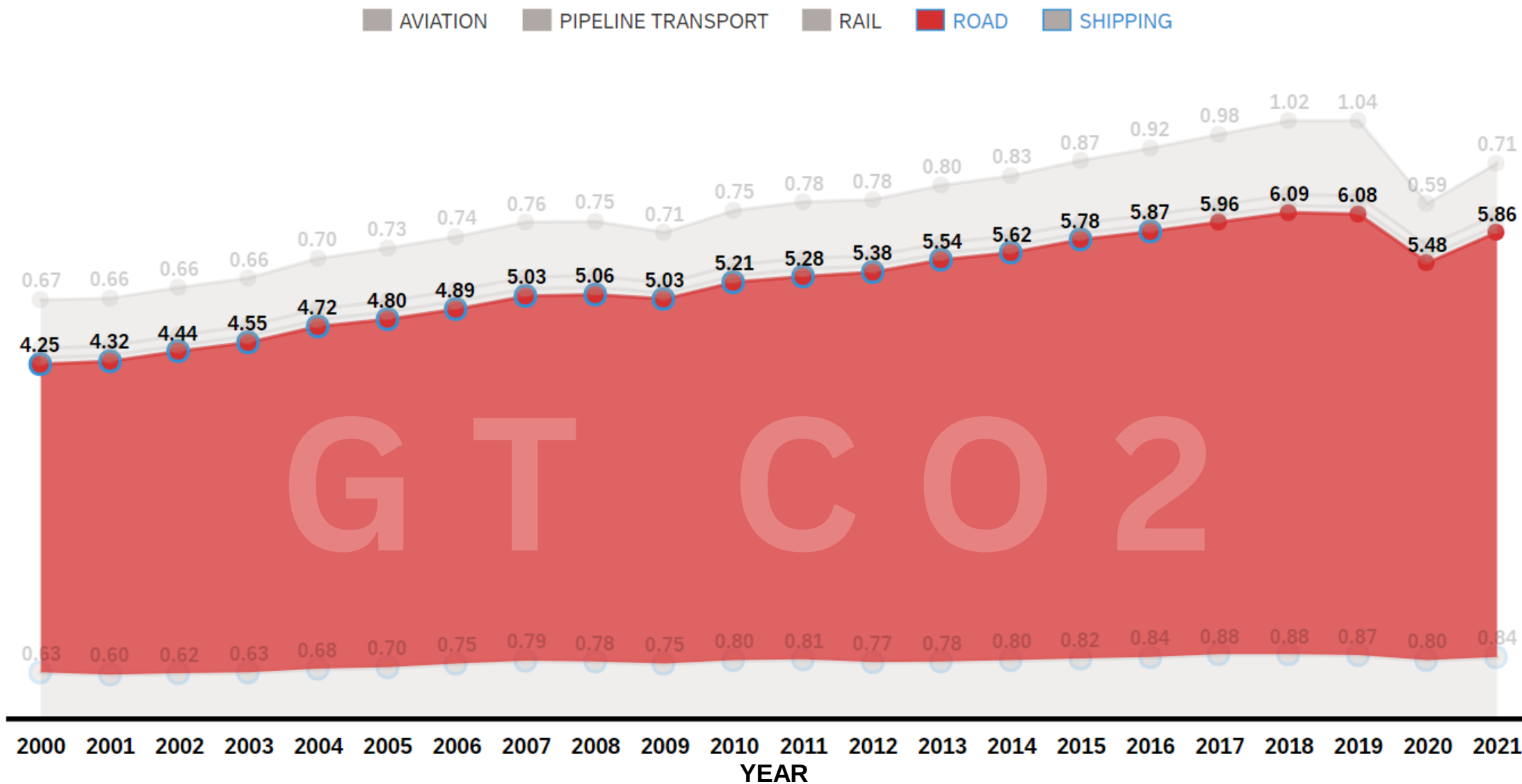
The Transportation is a major contributor to the release of harmful gaseous contaminants



SOURCE: Sources of greenhouse gas emissions | US EPA. (2023, April 28). US EPA.
<https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>

KILOMETER ZERO AN AVENUE TOWARDS A GREENER AND SMARTER CITIES

Global CO2 emissions from transport by Sub-sector



SOURCE: Global CO2 emissions from transport by sub-sector in the Net Zero Scenario, 2000-2030 – Charts – Data & Statistics - IEA. (n.d.). IEA. <https://www.iea.org/data-and-statistics/charts/global-co2-emissions-from-transport-by-sub-sector-in-the-net-zero-scenario-2000-2030>

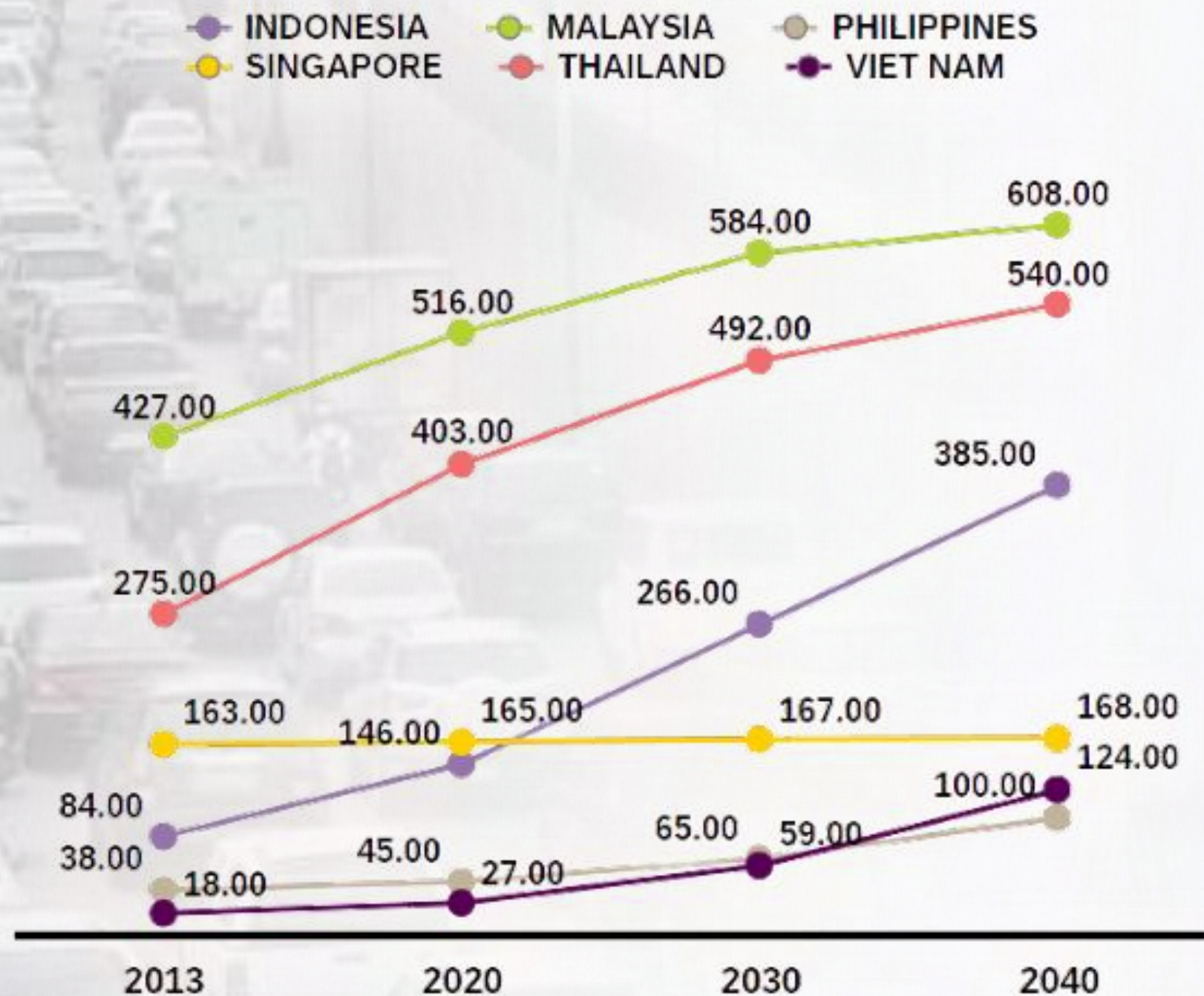
Road travel accounts for three-quarters of transport emissions. Most of this comes from passenger vehicles – cars and buses.

SOURCE: Cars, planes, trains: where do CO2 emissions from transport come from? (2020, October 6). Our World in Data. <https://ourworldindata.org/co2-emissions-from-transport>

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AN AVENUE TOWARDS A GREENER AND SMARTER CITIES

Vehicle ownership, saturation level and GDP per capita today and future projections



**VEHICLE OWNERSHIP IS
INCREASING**

SOURCE: ASEAN Secretariat. (2019). ASEAN Fuel Economy Roadmap for the Transport Sector 2018-2025: with focus on light-duty vehicles. ASEAN. <https://asean.org/book/asean-fuel-economy-roadmap-for-the-transport-sector-2018-2025-with-focus-on-light-duty-vehicles/>



99%

Almost all of the people
worldwide (99%), according
to the World Health
Organization, Breathe
unsafe air.

SOURCE: World Health Organization: WHO. (2019). Air pollution. www.who.int.
<https://www.who.int/health-topics/air-pollution>

Fossil fuel air pollution responsible for

8.7M

deaths worldwide

SOURCE: Fossil fuel air pollution caused 8.7m deaths globally. (n.d.). Airclim.
<https://www.airclim.org/acidnews/fossil-fuel-air-pollution-caused-87m-deaths-globally>



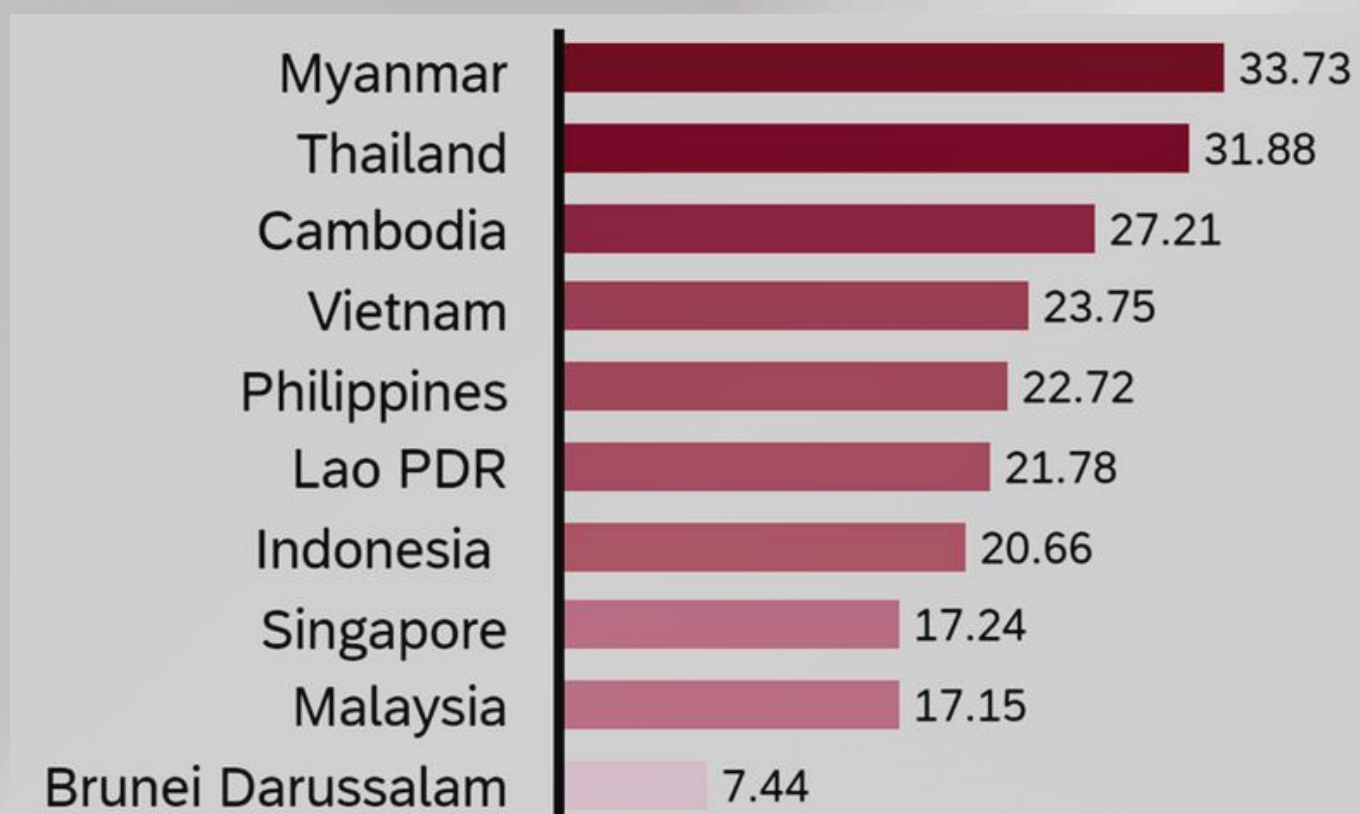
Fossil fuel air pollution causes
almost **1 in 5 deaths** globally each
year

SOURCE: Fossil fuel air pollution causes almost 1 in 5
deaths globally each year - CNN

KILOMETER ZERO AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES

IMAGE SOURCE: Harris, G. (2015, May 29). Opinion | Holding your breath in India. The New York
Times. <https://www.nytimes.com/2015/05/31/opinion/sunday/holding-your-breath-in-india.html>

Annual Mean Concentration of Fine Particulate Matters in Urban Areas of Southeast Asia, 2016 (in $\mu\text{g}/\text{m}^3$)



SOURCE: Admin, A. (2021, July 24). Confronting urban transport woes in Southeast Asia. The ASEAN. <https://theaseanmagazine.asean.org/article/confronting-urban-transport-woes-in-southeast-asia/?fbclid=IwAR3ePvOpPloheEnaGEDNxbgDXkLiKB4O2F3oactEDyXPTvkONkc6cL-fP2E>

Total Deaths Attributable to Ambient Air Pollution, 2016



SOURCE: Admin, A. (2021, July 24). Confronting urban transport woes in Southeast Asia. The ASEAN. <https://theaseanmagazine.asean.org/article/confronting-urban-transport-woes-in-southeast-asia/?fbclid=IwAR3ePvOpPloheEnaGEDNxbgDXkLiKB4O2F3oactEDyXPTvkONkc6cL-fP2E>

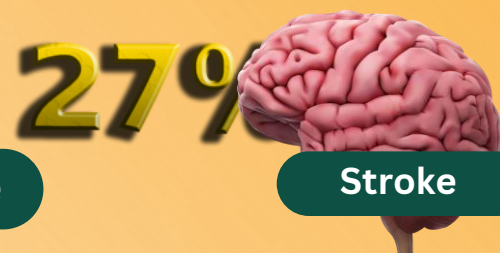
AIR POLLUTION: SILENT KILLER

WHO estimates more than
2 Million Deaths
have their in Southeast Asia Every Year

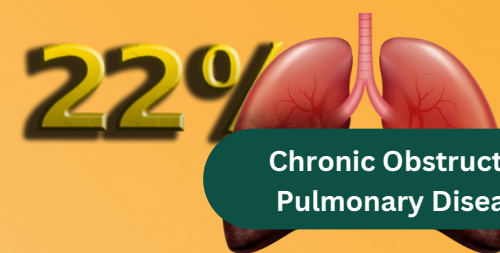
World Health Organization: WHO. (2021, September 22). New WHO Global Air Quality Guidelines aim to save millions of lives from air pollution. World Health Organization.
<https://www.who.int/news/item/22-09-2021-new-who-global-air-quality-guidelines-aim-to-save-millions-of-lives-from-air-pollution>



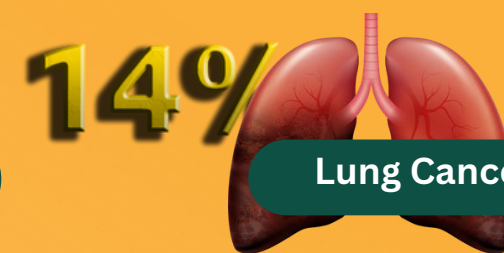
Ischaemic Heart Disease



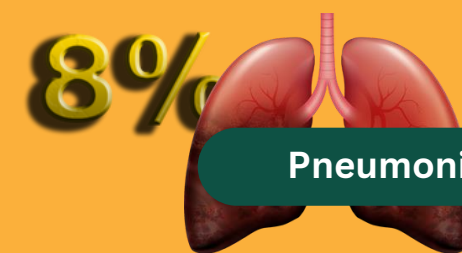
Stroke



Chronic Obstructive
Pulmonary Disease



Lung Cancer



Pneumonia

SOURCE: Deaths linked to outdoor and household air pollution. (n.d.). <https://www.who.int/mongolia/multi-media/item/deaths-linked-to-outdoor-and-household-air-pollution>

KILOMETER ZERO AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES

IMAGE SOURCE: Harris, G. (2015, May 29). Opinion | Holding your breath in India. The New York Times. <https://www.nytimes.com/2015/05/31/opinion/sunday/holding-your-breath-in-india.html>





TEAM ECHOVATION

The urgency to address the deteriorating state of our world, with its evident impacts on both humanity and the environment, demands immediate action.

IMAGE SOURCE: Harris, G. (2015, May 29). Opinion | Holding your breath in India. The New York Times. <https://www.nytimes.com/2015/05/31/opinion/sunday/holding-your-breath-in-india.html>

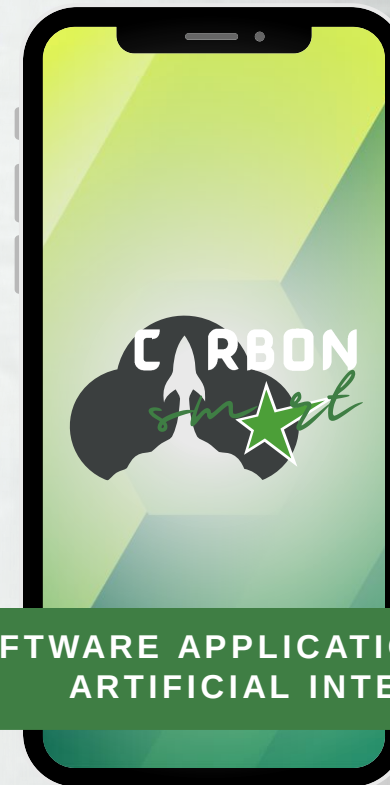
KILOMETER ZERO AN AVENUE TOWARDS A GREENER AND SMARTER CITIES



TEAM ECHOVATION

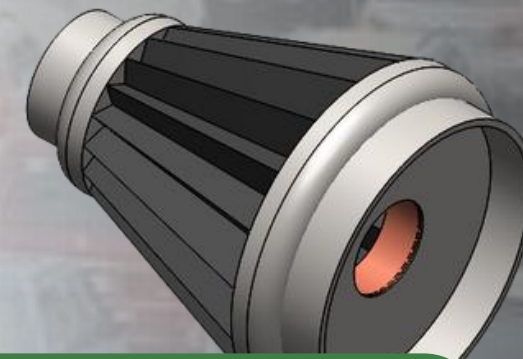
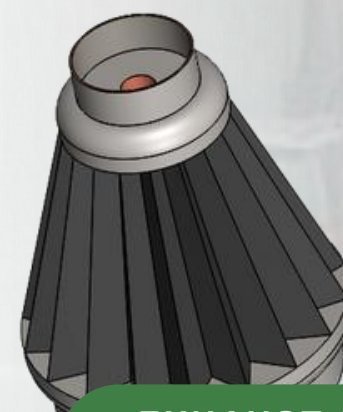
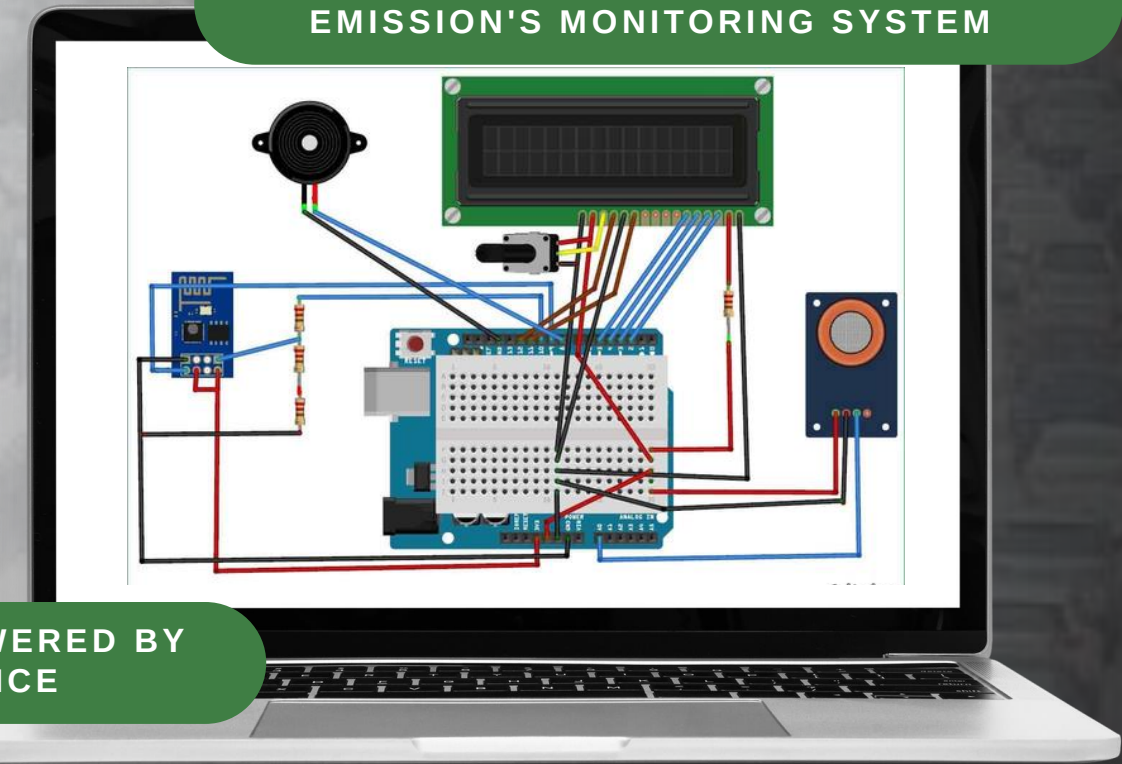
INTERCONNECTED WITH EACH OTHER

RECOMMENDATION



SOFTWARE APPLICATION POWERED BY
ARTIFICIAL INTELLIGENCE

ARDUINO BASED GREENHOUSE GAS
EMISSION'S MONITORING SYSTEM

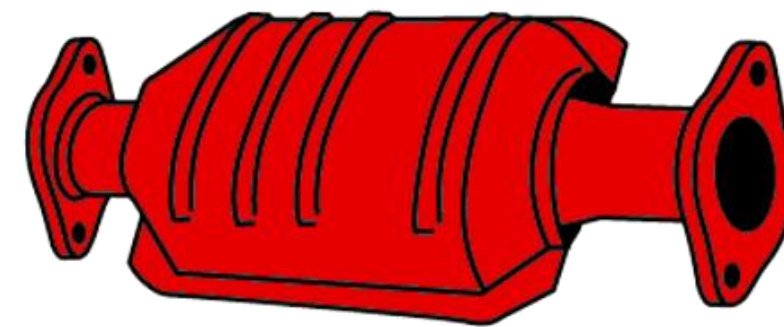
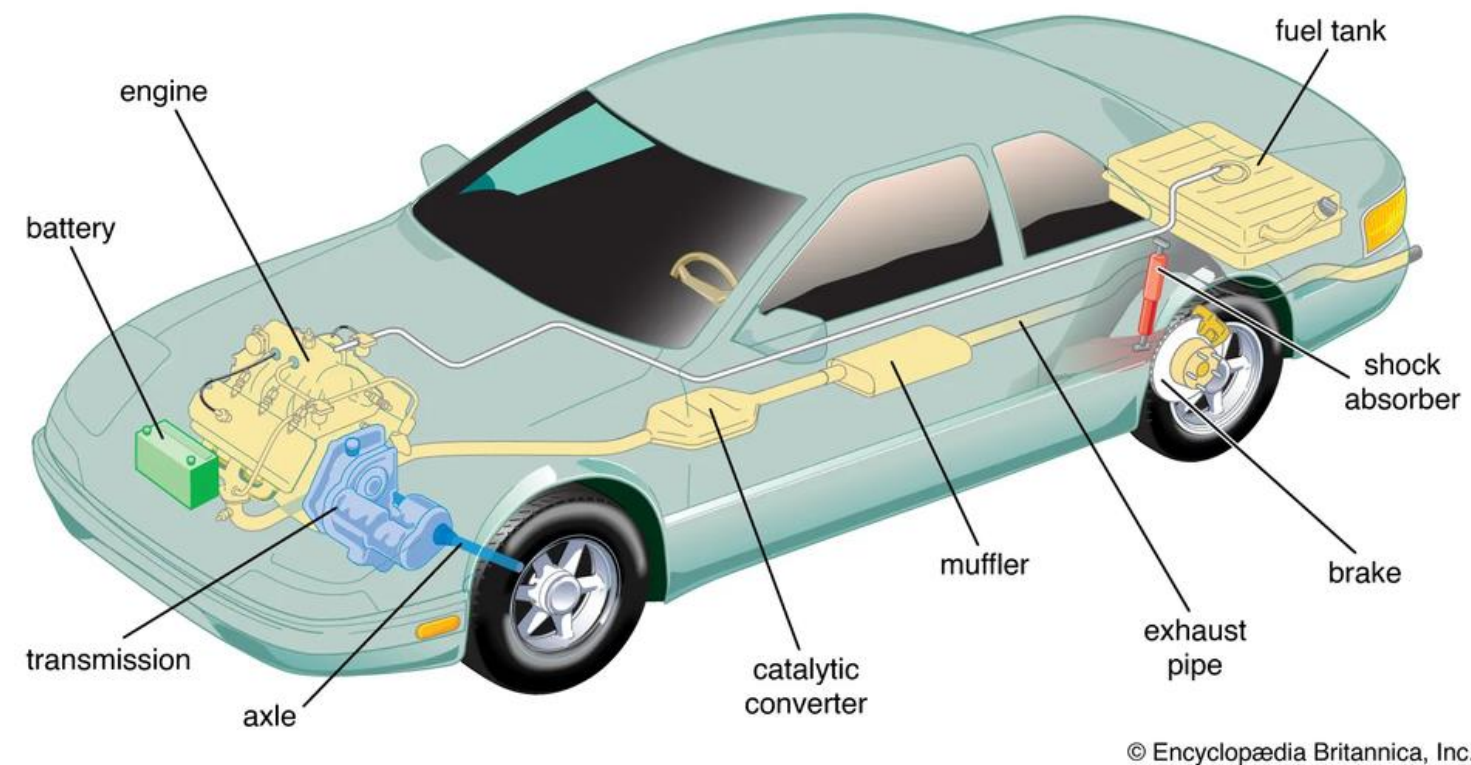


EXHAUST FILTRATION SYSTEM USING
CHARCOAL OR CARBON

KILOMETER ZERO

AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES

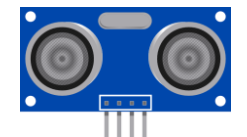
RECOMMENDATION



Catalytic converter



ARDUINO



EXHAUST FILTRATION SYSTEM USING
CHARCOAL OR CARBON

IMAGE SOURCE: Purdy, K. W., Cromer, G. C., Cromer, O. C., & Foster, C. G. (2023, June 28).
Automobile | Definition, History, industry, design, & Facts. Encyclopedia Britannica.
<https://www.britannica.com/technology/automobile#/media/1/44957/120667>

IMAGE SOURCE: Exhaust Inspection in State College, PA, Bellefonte, PA,
Boalsburg, PA | Tire Town. (n.d.). <https://www.tiretown.net/Auto-Repairs/cat/exhaust-system-repair/svc/exhaust-inspection>

KILOMETER ZERO AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES



RECOMMENDATION

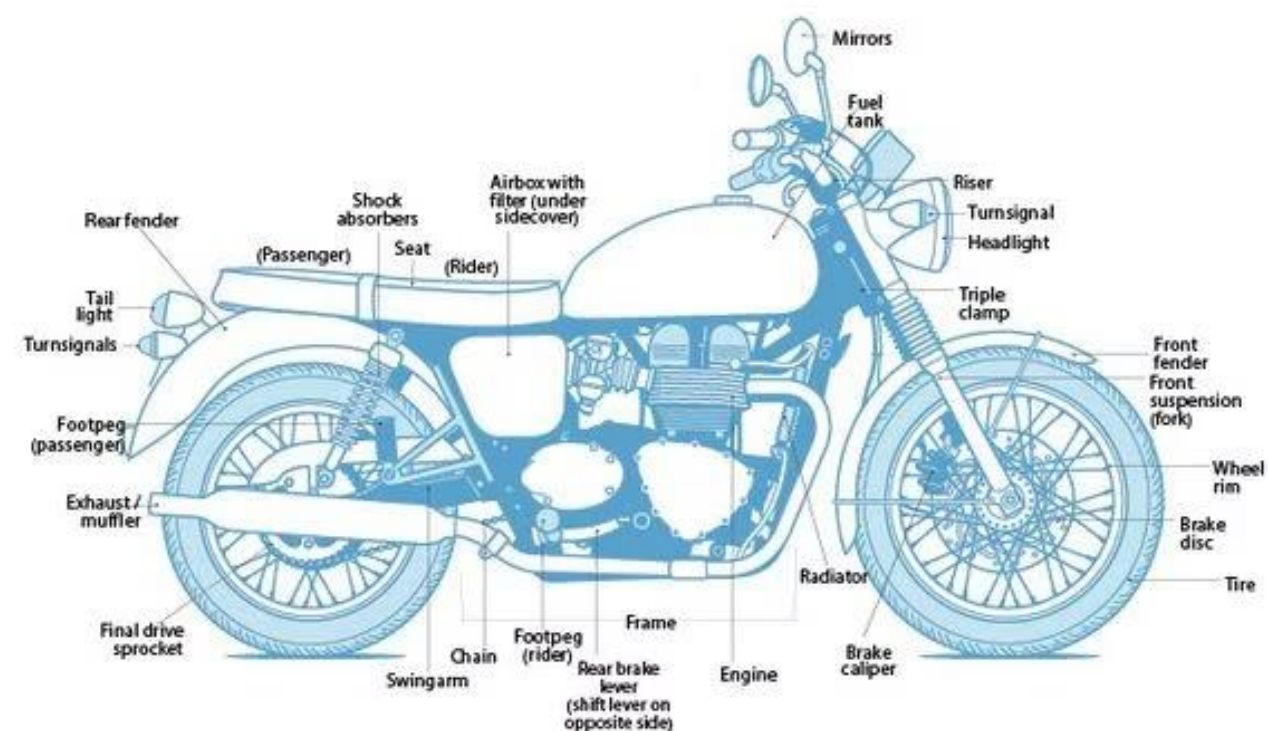
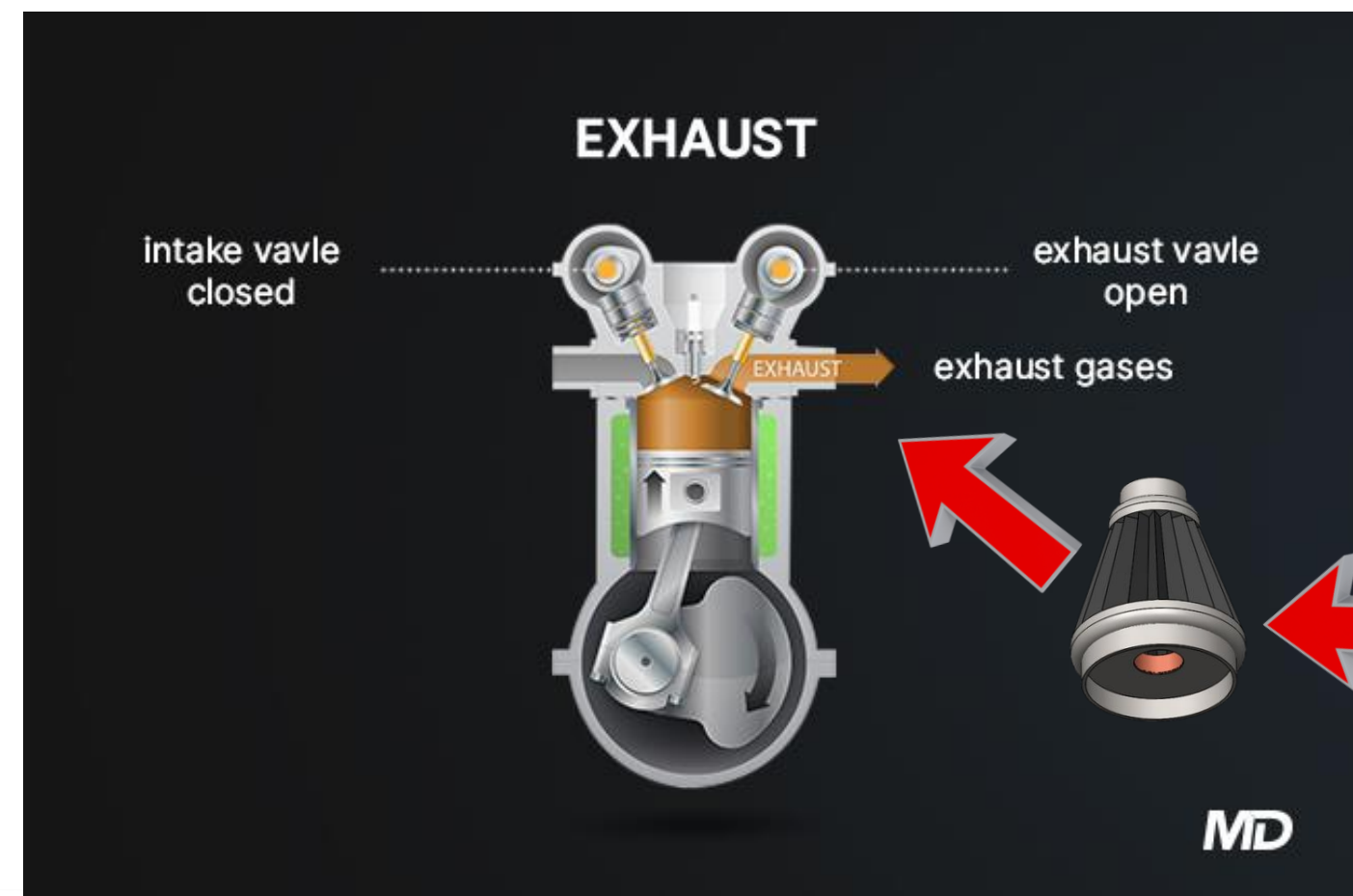


IMAGE SOURCE: Understanding a motorcycle parts diagram. (n.d.). Cycle World. <https://www.cycleworld.com/story/motorcycle-tips/learn-motorcycle-anatomy/>



EXHAUST FILTRATION SYSTEM USING CHARCOAL OR CARBON

IMAGE SOURCE: Purugganan, M. (2020). How four-stroke motorcycle engines work. MotoDeal. <https://www.motodeal.com.ph/articles/motorcycle-features/how-four-stroke-motorcycle-engines-work>

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RECOMMENDATION



A mobile app for tracking, reducing, and offsetting carbon footprint, promoting sustainability and eco-friendly practices.

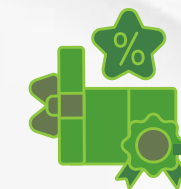
CARBON FEASIBLE FOCAL POINTS



EMISSION TRACKING



SOCIAL COLLABORATION



GAMIFICATION AND ENGAGEMENT



ENVIRONMENTAL EDUCATION



PARTNERSHIPS AND POLICY ADVOCACY



INCENTIVIZE



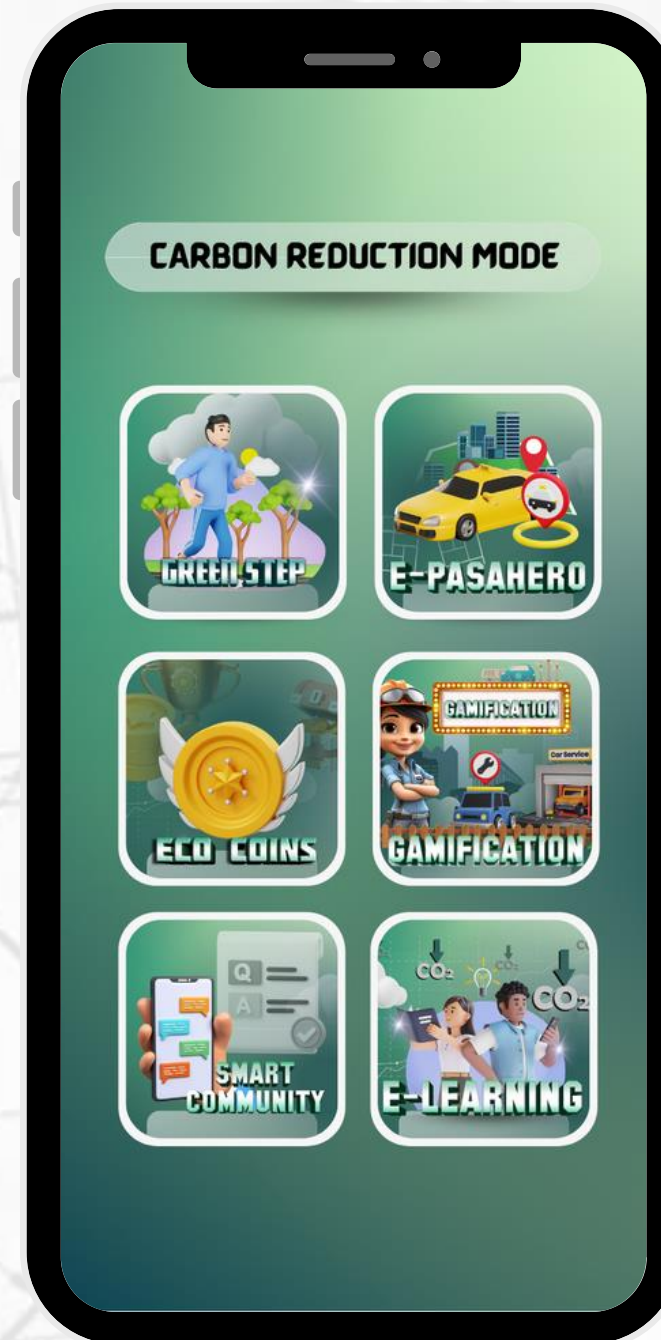
CARBON NEUTRALITY GOALS

TEAM ECHOVATION



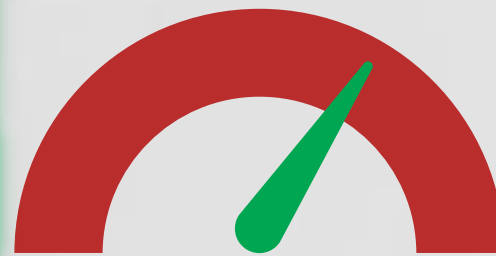


MODES





MODE FOR DRIVERS AND VEHICLE OWNERS



CARBON TRACKER



CARBON NAVIGATOR



GREEN TRANSPORTATION



CARBON OFFSET

KILOMETER ZERO AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES



INCENTIVIZING CARBON REDUCTION



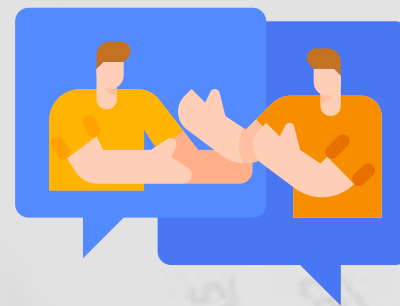
TRADING ECO COINS

KILOMETER ZERO AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES



CARBONWISE GUIDE

KNOWLEDGE BOOST



COMMUNITY CONNECT



CARBON UPDATES

KILOMETER ZERO AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES



**IT IS THE HELPING
TOOL FOR
COMMUTERS TO
REDUCE CARBON
EMISSION,**



PROGRESS TRACKING



GREEN MILESTONE BADGES

KILOMETER ZERO AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES



GREEN TRANSPORTATION



CARBON OFFSET

KILOMETER ZERO AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES



INCENTIVIZING CARBON REDUCTION



TRADING ECO COINS

KILOMETER ZERO AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES



GAMIFIED SUSTAINABILITY



ENGAGING REWARD

KILOMETER ZERO AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES



CARBONWISE GUIDE

KNOWLEDGE BOOST



COMMUNITY CONNECT



CARBON UPDATES

CARBON SMART USERS



LISA



SIRO



ROBI



Hi! I am Robi.

**I AM A VEHICLE OWNER, I USED
CARBONSMART AND IT IS MY TICKET TO
AI-DRIVEN INSIGHTS, SHORTCUTS, AND
FUEL SAVINGS.**

Hi! I am Siro.

I AM AN AVID INCENTIVE ENTHUSIAST, I
USED CARBONSMART TO GET A
REWARD IN MY ADVENTURES, WHERE
EVERY ECO-FRIENDLY CHOICE EARNS
MY VALUABLE INCENTIVES.



Hi! I am Lisa.

I AM A BUSINESS OWNER! MY STORE HAS A UNIQUE ARRANGEMENT WHERE SIRO CAN TRADE HIS ECO POINTS TO AVAIL PRODUCTS AND SERVICES FROM MY STORE.

STORE



KILOMETER ZERO

TEAM ECHOVATION

AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES

WHAT IF?



KILOMETER ZERO

TEAM ECHOVATION

AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES



WHAT IF?

1 ACTIVE USER/HOUSEHOLD

HE REPLACED HIS CAR WITH 25 MPG.

ELECTRIC CAR = 4.4 TONS/ YEAR

X 1, 000 USERS



KILOMETER ZERO

TEAM ECHOVATION

AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES



WHAT IF?

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X 1, 000 USERS

4,400
CO2 TONS PER YEAR

**Assumption: Driving 12,000 miles per year*



KILOMETER ZERO

TEAM ECHOVATION

AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES

WHAT IF?



KILOMETER ZERO

TEAM ECHOVATION

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KILOMETER ZERO

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X 1, 000, 000 USERS

4,400,000
CO₂ TONS PER YEAR

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KILOMETER ZERO

TEAM ECHOVATION

AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES



WHAT IF?



KILOMETER ZERO

TEAM ECHOVATION

AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES



WHAT IF?

**1 ACTIVE USER/HOUSEHOLD
E - PASAHERO**

CARPOOLING	0.9 TONS/ YEAR
PUBLIC TRANSPORTATION	= 0.5 TONS/ YEAR
BIKE	0.7 TONS/ YEAR

2.1 TONS/ YEAR
X 1, 000 USERS



KILOMETER ZERO

TEAM ECHOVATION

AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES



WHAT IF?

1 ACTIVE USER/HOUSEHOLD
E - PASAHERO

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**PUBLIC TRANSPORTATION =	0.5 TONS/ YEAR
***BIKE	0.7 TONS/ YEAR

2.1 TONS/ YEAR
X 1,000 USERS

2,100
CO2 TONS PER YEAR

*Assumption: Car gets 25 mpg, commute is 25 miles round trip, carpool with one other person

**Assumption: Riding a Bus as a Public Transport

*** Assumption: Current car gets 25 mpg

KILOMETER ZERO

TEAM ECHOVATION

AN AVENUE TOWARDS A GREENER
AND SMARTER CITIES



WHAT IF?



KILOMETER ZERO

TEAM ECHOVATION

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KILOMETER ZERO

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2.1 TONS/ YEAR
X 1, 000, 000 USERS

2,100,000
CO2 TONS PER YEAR

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***Assumption: Riding a Bus as a Public Transport*

**** Assumption: Current car gets 25 mpg*

KILOMETER ZERO

TEAM ECHOVATION

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WHAT IF?

WE COMBINE

2.1 CO₂ TONS PER YEAR

4.4 CO₂ TONS PER YEAR

6.5 CO₂ tons/year



CARBONSMART TIMELINE



YEAR 1



DEVELOPMENT AND
REFINEMENT



INITIAL PARTNERSHIP



AUTOMOTIVE
COMPANIES



IT
COMPANIES



DEPARTMENT OF
ENVIRONMENT



CONVIENCE
STORES

YEAR 2



PILOT PROGRAM



DATA COLLECTION AND ANALYSIS

YEAR 3



EXPANSION AND SCALING



YEAR 4



AWARENESS CAMPAIGNS



POLICY ADVOCACY



WIDE ADOPTION AND IMPACT

YEAR 5



REGIONAL EXPANSION

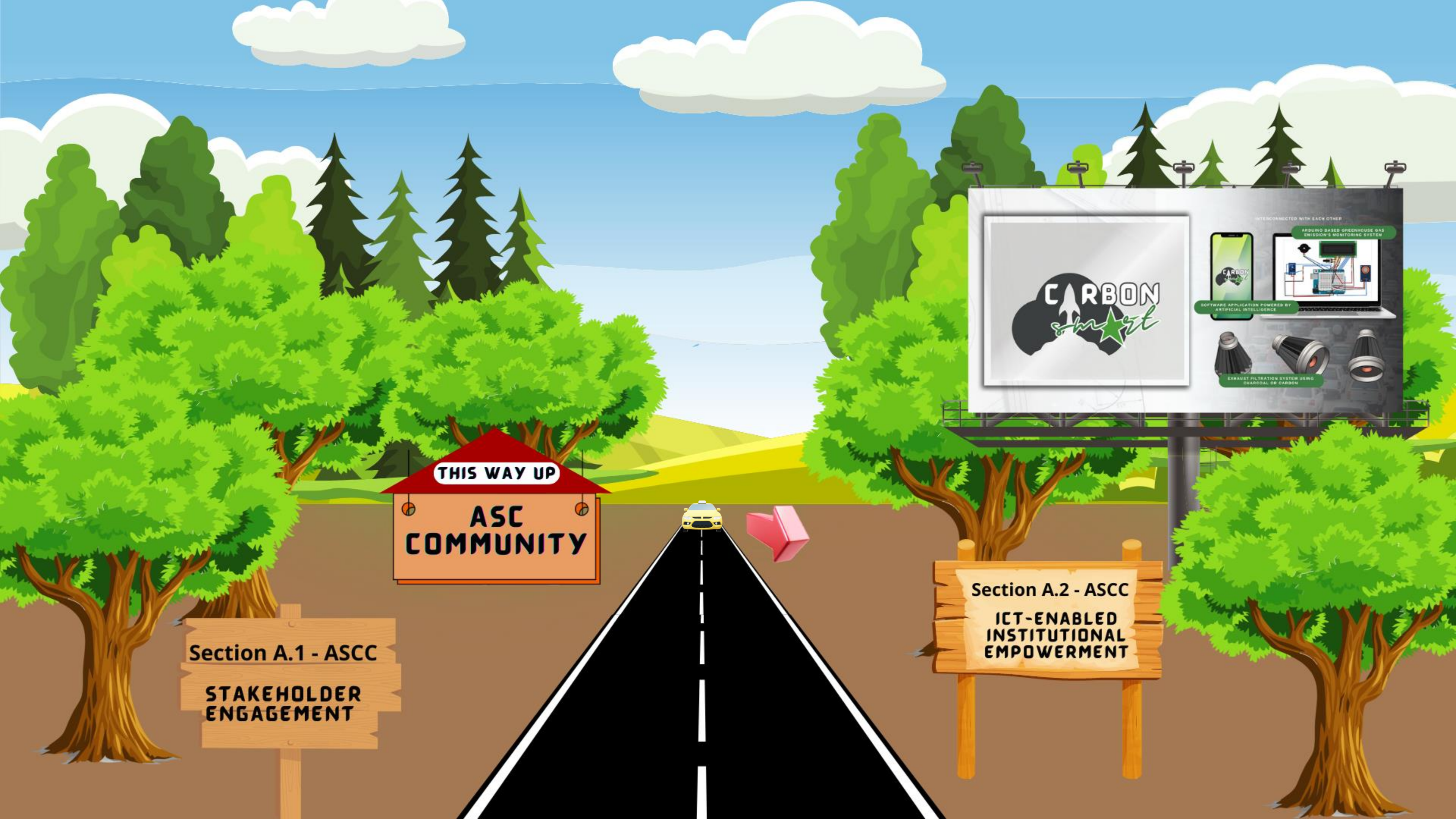


STRENGTHENED PARTNERSHIPS



CONTINUOUS IMPROVEMENT





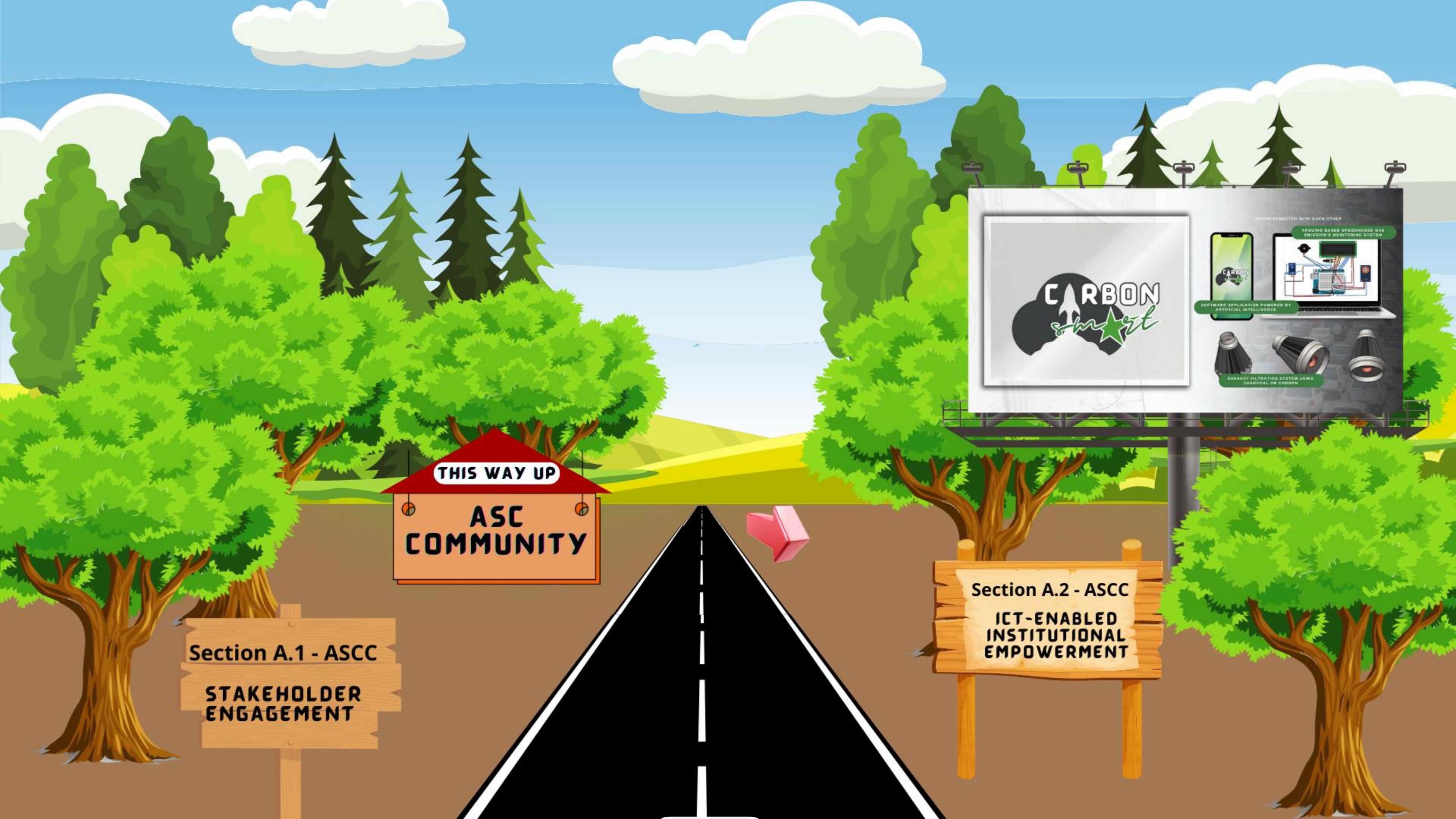
THIS WAY UP

ASC
COMMUNITY

Section A.1 - ASCC
STAKEHOLDER
ENGAGEMENT

Section A.2 - ASCC
ICT-ENABLED
INSTITUTIONAL
EMPOWERMENT





THIS WAY UP

ASC
COMMUNITY

Section A.1 - ASCC

STAKEHOLDER
ENGAGEMENT

Section A.2 - ASCC

ICT-ENABLED
INSTITUTIONAL
EMPOWERMENT





Section C.2 - ASCC
SUSTAINABLE CITY
MANAGEMENT

Section C.3 - ASCC
SUSTAINABLE
CLIMATE

Section C.4 - ASCC
SUSTAINABLE
CONSUMPTION AND
PRODUCTION

THIS WAY

Section B.1 - ASCC
REDUCING
BARRIERS

Section B.2- ASCC
EQUITABLE ACCESS FOR ALL

WELCOME
TO
ASEAN SOCIO-CULTURAL COMMUNITY

Section C.2 - ASCC
SUSTAINABLE CITY
MANAGEMENT

Section C.3 - ASCC
SUSTAINABLE
CLIMATE

Section C.4 - ASCC
SUSTAINABLE
CONSUMPTION AND
PRODUCTION

THIS WAY

Section B.1 - ASCC
REDUCING
BARRIERS

Section B.2- ASCC
EQUITABLE ACCESS FOR ALL

Section B.4- AECBP
TECH ADOPTION
AND DIFFUSION

Section A.4 - AECBP
FINANCIAL
INCLUSION FOR
MSMES

Section B.8- AECBP
ECONOMIC
DEVELOPMENT
AND GROWTH



Section B.4- AECBP
**TECH ADOPTION
AND DIFFUSION**

Section A.4 - AECBP
**FINANCIAL
INCLUSION FOR
MSMES**

Section B.8- AECBP
**ECONOMIC
DEVELOPMENT
AND GROWTH**





WELCOME
TO
ASEAN ECONOMIC COMMUNITY

Section C.2 - AECBP
DIGITAL INCLUSION

Section C.4 - AECBP
ASEAN ENERGY
MARKET
INTEGRATION

Section C.3 - AECBP
E-COMMERCE



WELCOME
TO
ASEAN ECONOMIC COMMUNITY

Section C.2 - AECBP
DIGITAL INCLUSION

Section C.4 - AECBP
ASEAN ENERGY
MARKET
INTEGRATION

Section C.3 - AECBP
E-COMMERCE



Section D.1 - AECBP
ENHANCING MSME
COMPETITIVENESS

Section D.2 - AECBP
PRIVATE SECTOR
PARTICIPATION

Section D.4 - AECBP
SUSTAINABLE
CONSUMPTION
THROUGH PPPS



Section D.1 - AECBP
ENHANCING MSME
COMPETITIVENESS

Section D.2 - AECBP
PRIVATE SECTOR
PARTICIPATION

Section D.4 - AECBP
SUSTAINABLE
CONSUMPTION
THROUGH PPPs



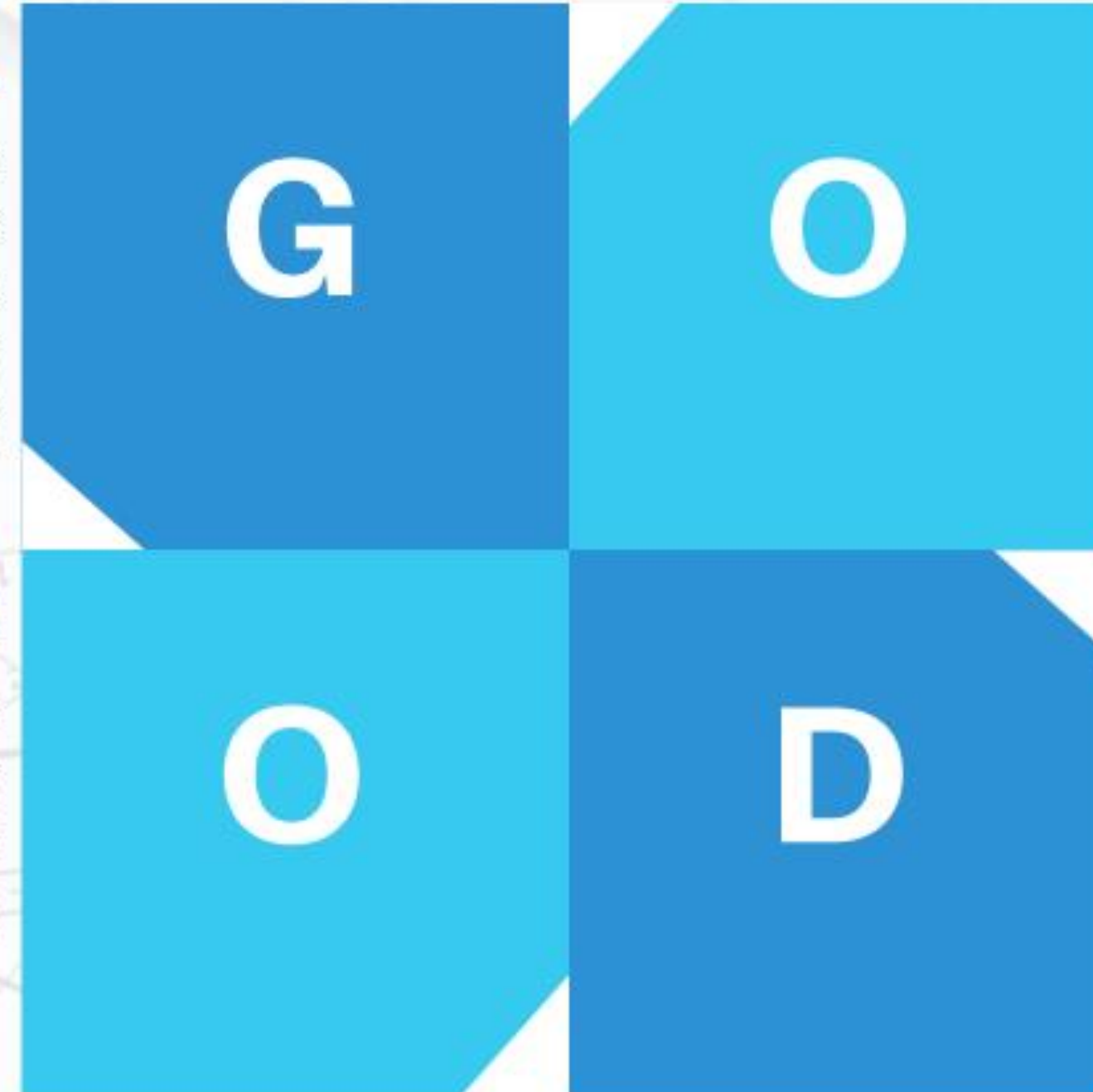
SUMMARY

GOAL

To transform cities into smarter and greener where sustainable transportation options are the norm, leading to reduced carbon emissions and improved environmental sustainability while enhancing residents' overall quality of life.

OBSTACLE

Resistance from traditional automotive industries, public reluctance, funding challenges, and political support may hinder smooth implementation of this mobility initiative.



OBJECTIVE

To promote sustainable transportation options and integrate smart technologies in urban mobility to reduce carbon emissions, alleviate traffic congestion, and enhance the overall quality of life in cities.

DATA-DRIVEN SOLUTION

Carbon Smart is our starting point, our kilometer zero, towards revolutionizing cities by encouraging sustainable transportation choices which enables a seamless integration of smart technologies, educating drivers and commuters to make informed decisions in their daily transportation to create an environmentally literate society.

BANI WORLD

BRITTLE. ANXIOUS. NONLINEAR. INCOMPREHENSIBLE



WE CAN EMPOWER EVERYONE
THROUGH OUR

MICRO-EFFORTS

WE CAN ACHIEVE

MACRO-EFFECT

KILOMETER
ZERO

Thank

You



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REFERENCES

Admin, A. (2021, July 24). Confronting urban transport woes in Southeast Asia. The ASEAN. <https://theaseanmagazine.asean.org/article/confronting-urban-transport-woes-in-southeast-asia/?fbclid=IwAR3ePvOpPloheEnaGEDNxbgDXkLiKB4O2F3oactEDyXPTvkONkc6cL-fP2E>

ASEAN Secretariat. (2015). ASEAN Economic Community Blueprint 2025. asean.org. <https://asean.org/asean-economic-community-blueprint-2025/>

ASEAN Secretariat. (2019). ASEAN Fuel Economy Roadmap for the Transport Sector 2018-2025: with focus on light-duty vehicles. ASEAN. <https://asean.org/book/asean-fuel-economy-roadmap-for-the-transport-sector-2018-2025-with-focus-on-light-duty-vehicles/>

ASEAN Socio-Cultural Community Blueprint 2025 – ASEAN Data Science Explorer. (n.d.). <https://aseandse.org/asean-socio-cultural-community-blueprint-2025/>

Cars, planes, trains: where do CO2 emissions from transport come from? (2020, October 6). Our World in Data. <https://ourworldindata.org/co2-emissions-from-transport>

Deaths linked to outdoor and household air pollution. (n.d.). <https://www.who.int/mongolia/multi-media/item/deaths-linked-to-outdoor-and-household-air-pollution>

Exhaust Inspection in State College, PA, Bellefonte, PA, Boalsburg, PA | Tire Town. (n.d.). <https://www.tiretown.net/Auto-Repairs/cat/exhaust-system-repair/svc/exhaust-inspection>

Fossil fuel air pollution causes almost 1 in 5 deaths globally each year - CNN

Fossil fuel air pollution caused 8.7m deaths globally. (n.d.). Airclim. <https://www.airclim.org/acidnews/fossil-fuel-air-pollution-caused-87m-deaths-globally>

Global CO2 emissions from transport by sub-sector in the Net Zero Scenario, 2000-2030 – Charts – Data & Statistics - IEA. (n.d.). IEA. <https://www.iea.org/data-and-statistics/charts/global-co2-emissions-from-transport-by-sub-sector-in-the-net-zero-scenario-2000-2030>

Handayani, K., Anugrah, P., Goembira, F., Overland, I., Suryadi, B., & Swandaru, A. (2022). Moving beyond the NDCs: ASEAN pathways to a net-zero emissions power sector in 2050. Applied Energy, 311, 118580. <https://doi.org/10.1016/j.apenergy.2022.118580>



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KILOMETER ZERO AN AVENUE TOWARDS A GREENER AND SMARTER CITIES



REFERENCES

Harris, G. (2015, May 29). Opinion | Holding your breath in India. The New York Times. <https://www.nytimes.com/2015/05/31/opinion/sunday/holding-your-breath-in-india.html>

NASA Earth Observatory. (n.d.). World of Change: Global temperatures. <https://earthobservatory.nasa.gov/world-of-change/global-temperatures/show-all>

Newey, B. S. (n.d.). Covid patients exposed to higher pollution levels 'hospitalised for longer,' says study. The Telegraph. <https://www.telegraph.co.uk/global-health/science-and-disease/covid-coronavirus-pollution-air-quality-death-hospitals/>

Purdy, K. W., Cromer, G. C., Cromer, O. C., & Foster, C. G. (2023, June 28). Automobile | Definition, History, industry, design, & Facts. Encyclopedia Britannica. <https://www.britannica.com/technology/automobile#/media/1/44957/120667>

Purugganan, M. (2020). How four-stroke motorcycle engines work. MotoDeal. <https://www.motodeal.com.ph/articles/motorcycle-features/how-four-stroke-motorcycle-engines-work>

Systems, K. R. (n.d.). The dangerous effects of air pollution on senior citizens. <https://www.kent.co.in/blog/the-negative-effects-of-air-pollution-on-senior-citizens/>

Sources of greenhouse gas emissions | US EPA. (2023, April 28). US EPA. <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>

Understanding a motorcycle parts diagram. (n.d.). Cycle World. <https://www.cycleworld.com/story/motorcycle-tips/learn-motorcycle-anatomy/>

World Health Organization: WHO. (2019). Air pollution. [www.who.int](https://www.who.int/health-topics/air-pollution). <https://www.who.int/health-topics/air-pollution>

World Health Organization: WHO. (2021, September 22). New WHO Global Air Quality Guidelines aim to save millions of lives from air pollution. World Health Organization. <https://www.who.int/news/item/22-09-2021-new-who-global-air-quality-guidelines-aim-to-save-millions-of-lives-from-air-pollution>

Yearly Carbon dioxide peak | Climate Central. (n.d.). <https://www.climatecentral.org/climate-matters/yearly-carbon-dioxide-peak>



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APPENDIX 1

Here's a potential timeline for the development and partnership initiatives of CarbonSmart, along with collaborations with automotive companies and the Departments of Environment in ASEAN countries:

Year 1:

- **Development and Refinement:** CarbonSmart initiates its development, focusing on building a robust and user-friendly software application that incorporates emission tracking, filtration systems, gamification, and social collaboration features.
- **Initial Partnerships:** CarbonSmart begins reaching out to automotive companies and the Department of Environment in ASEAN countries to discuss potential collaborations and partnerships. Department of Environment Partnerships: Collaborate with the Departments of Environment in ASEAN countries to explore joint initiatives, share data, and leverage their expertise to enhance the impact of CarbonSmart.

Year 2:

- **Pilot Programs:** CarbonSmart launches pilot programs in selected ASEAN countries, partnering with a few automotive companies and the Department of Environment in those regions. These programs aim to test the effectiveness of the application, gather feedback, and fine-tune the features based on user experiences.
- **Data Collection and Analysis:** CarbonSmart collects and analyzes data on carbon emissions from transportation in rural and urban areas within the pilot countries, providing valuable insights for further improvements.

Year 3:

- **Expansion and Scaling:** Focus on expanding the user base of CarbonSmart, targeting larger organizations. With positive outcomes from the pilot programs, CarbonSmart expands its reach to more ASEAN countries, establishing partnerships with additional automotive companies and the Department of Environment in each country.

Year 4:

- **Awareness Campaigns:** CarbonSmart conducts awareness campaigns and educational initiatives, collaborating with its partners to raise awareness about the impact of transportation-related emissions and the role individuals and organizations can play in reducing carbon footprints.
- **Policy Advocacy:** Collaborate with the Departments of Environment in ASEAN countries to advocate for policies and regulations that support carbon reduction efforts and promote the adoption of CarbonSmart.
- **Wide Adoption and Impact:** CarbonSmart achieves significant adoption among individuals, organizations, and automotive companies in ASEAN countries, leading to a substantial reduction in carbon emissions from transportation.

Year 5:

- **Regional Expansion:** Extend the reach of CarbonSmart to all ASEAN countries, ensuring localization and customization according to the specific needs and regulations of each country.
- **Strengthened Partnerships:** Deepen partnerships with automotive companies by integrating CarbonSmart into their sustainability programs and providing ongoing support for data analysis and carbon reduction strategies.
- **Continuous Improvement:** CarbonSmart continues to enhance its features and functionalities based on user feedback and technological advancements, ensuring its ongoing relevance and effectiveness in the fight against climate change.

APPENDIX 2

By 2025, all following initiatives in ASEAN Economic Community Blueprint (AECBP) are achieved;

Section A.4 - AECBP

Promote financial inclusion to deliver financial products and services to a wider community that is under-served, including MSMEs.

Section B.8 - AECBP

Sustainable Economic Development and growth agenda that promotes the use of clean energy as well as enhances sustainable consumption and production

Section C.3 - AECBP

Facilitating foreign investment through the supply of intermediary services

Section D.1 - AECBP

to enhance the Micro, Small, and Medium Enterprises' competitiveness, resilience and to enable greater benefits from ASEAN integration.

Section D.4 - AECBP

Narrowing the Development Gap by Sustaining the pace of economic growth among ASEAN Member States

Section B.4 - AECBP

Giving the critical role of technology adaptation and diffusion.

Section C.2 - AECBP

Prioritising the bridging of the digital gap

Section C.4 - AECBP

Enhancing energy connectivity and market integration in ASEAN to achieve energy security, accessibility, affordability and sustainability for all.

Section D.2 - AECBP

Improving the greater involvement of the private sector and the structured participation will be beneficial to the achievement of ASEAN goals.

SOURCE: ASEAN Socio-Cultural Community Blueprint 2025 – ASEAN Data Science Explorer. (n.d.). <https://aseandse.org/asean-socio-cultural-community-blueprint-2025/>

APPENDIX 2.1.

By 2025, all following initiatives in ASEAN Socio-cultural Community Blueprint (ASCC) are achieved;

Section A.1 - ASCC

Engaging Stakeholders in ASEAN processes by policy making initiatives; programme development; and promotion of public awareness

Section B.1 - ASCC

Reducing Barriers and promotes equitable access to the technology; providing great opportunities for all

Section C.2 - ASCC

Developing Environmentally Sustainable Cities while Strengthening the policies and strategies for the effective impact management of population growth and migration on cities

Section C.4 - ASCC

Developing a Sustainable Consumption and Production by Strengthening public-private partnerships for maximising resource efficiency and Promote environmental knowledge and skills to adopt sustainable consumption



Section A.2 - ASCC

Empowering People and Strengthening Institutions by harnessing the use of ICT across the globe; Increasing competencies and resilience to improve institutional capacity to address current challenges

Section B.2 - ASCC

Promoting equitable Access and opportunities for all including the people living in remote and border areas

Section C.3 - ASCC

Promoting Sustainable Climate with Strengthening human and institutional capacity in implementing climate change adaptation and mitigation.

SOURCE: ASEAN Socio-Cultural Community Blueprint 2025 – ASEAN Data Science Explorer. (n.d.).
<https://aseandse.org/asean-socio-cultural-community-blueprint-2025/>

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APPENDIX 3

ONE TIME SET UP CAPITAL	
Name Approval Fee	\$ 3,642.66
Company Registration Fee	\$ 1,824.79
Legal Compliance Consultation	\$ 6,465.71
App Development Cost	\$ 35,319.90
OPERATING COSTS (YEARLY)	
Insurance	\$ 20,748.20
Legal Cost	\$ 24,927.97
Research & Development	\$ 80,933.16
Marketing Cost	\$ 20,448.00
Salaries Payable	\$ 149,528.28
Database Hosting	\$ 60,705.82
AI Builder	\$ 129,706.22
Database Design	\$ 15,749.29
TOTAL EXPENDITURE	\$ 550,000.00

APPENDIX 5

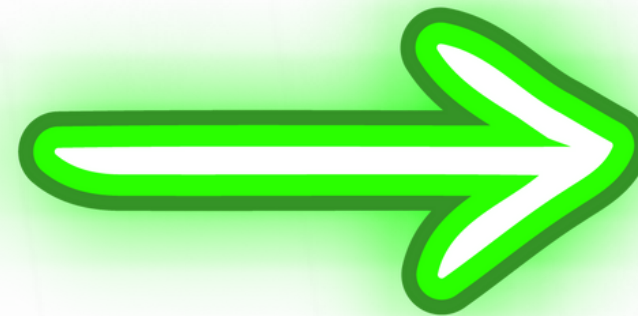
668 MILLION

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APPENDIX 4

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- By 2030, CarbonSmart promote sustainable transportation options and reducing reliance on fossil fuel-powered vehicles, these initiatives contribute to climate action goals and the transition to a low-carbon economy..
- By 2030, CarbonSmart initiatives significantly contribute to climate action by reducing the carbon footprint of urban transportation. By promoting sustainable modes of travel, such as walking, cycling, and public transportation, Kilometers Zero initiatives help mitigate greenhouse gas emissions, thereby addressing climate change and its impacts.



- By 2030, CarbonSmart encourage sustainable mobility practices, such as carpooling, ride-sharing, and the use of electric or low-emission vehicles, these initiatives contribute to responsible consumption and production patterns.
- By 2030, CarbonSmart initiatives reduce vehicular emissions and improve air quality within urban areas, which positively impacts the health and well-being of residents. Cleaner air can help reduce respiratory illnesses and other health issues associated with air pollution.



- By 2030, CarbonSmart initiatives promote sustainable urban development by reducing carbon emissions, improving air quality, and enhancing public transportation. They contribute to creating inclusive, safe, resilient, and sustainable cities and communities.
- By 2030, CarbonSmart promote sustainable transportation options and reducing private vehicle use, Kilometers Zero initiatives help alleviate traffic congestion, leading to smoother traffic flow and reduced travel times. This improves the efficiency and livability of cities.