

天主教輔仁大學英國語文學系學士班畢業成果  
ENGLISH DEPARTMENT, FU JEN CATHOLIC UNIVERSITY  
GRADUATION PROJECT 2021

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Dr. Bichu Chen

**TSMC: A Well-Known Semiconductor Company in Taiwan**

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Joanne, Yu-Hsuan Lee

**Technology Assisted Instruction and Presentation**  
**TSMC: A Well-Known Semiconductor Company in Taiwan**

**Joanne Lee**

**406110425**

**30 June 2021**

Google Site Links

1. Group Site Homepage: <https://sites.google.com/view/introducing-tsmc/home?authuser=0>
2. My self-created subpages: <https://sites.google.com/view/introducing-tsmc/environmental-goals?authuser=0>

Project Oral Presentation Link

<https://youtu.be/0H4XeIN7ZZE>

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# **TSMC: A Well-Known Semiconductor Company in Taiwan**

## **I. Introduction of Group Project**

### **A. Motivation and Background Information**

Our group motivation of this project is to introduce how TSMC is a good company by viewing its SDG performance in their economical goals, environmental goals, social goals, and operation strategy.

Purpose 1: To show that aside from business, TSMC is also putting much effort into reaching SDG goals.

Purpose 2: To elaborate on how TSMC achieves SDG in the field of economy, environment, and society.

Purpose 3: To help people who are interested in investment, research, or planning to work in TSMC as a career by showing the operation values of the company

### **B. Short Introduction**

TSMC, as the head of a semiconductor company in Taiwan, not only supports an important market of technology and electronic industry but also focuses a lot on achieving SDG goals, aiming to balance business and its social duty.

First of all, TSMC's economic goals include SDG 8, 9, and 12.

Secondly, TSMC aims to reach environmental goals including SDG6, 7, 13 by green manufacturing, developing water management, waste management, air pollution control, and climate change and energy management. In

TSMC's green manufacturing, they established water recycling applications through water resources management, developing diverse water sources, and developing preventive measures. Concerning SDG7, TSMC carries on waste

management and air pollution control. For waste management, TSMC focuses on source reduction, circular economy, and audit and guidance. As for air pollution control, TSMC applies BAT (best available technology) and effective reduction of emission from source-local scrubbers. Moreover, they also strengthen monitoring of prevention facilities. Besides, regarding SDG 13, TSMC is well prepared to face the severe environment affected by climate change through strengthening climate resilience. Also, to provide clean energy, TSMC manages to drive low-carbon manufacturing, use renewable energy, and increase energy efficiency.

Moreover, to achieve social goals following SDG3, 4, 8, 12, and 13, TSMC is determined to engage in more volunteering activities that help the minority groups in society. Last but not least, TSMC prioritizes the goals of omitting inequalities and matters of human rights, following SDG 4, 5, and 10.

## **II. Project Content Explanations: Content, Text level**

### **A. Group Focus:**

#### **1. Home Page**

- About us
- What is SDG?
- What about TSMC

#### **2. Economic Goals**

- Business plans: TSMC, Acer, Asus

#### **3. Environmental Goals**

- Water Management
- Waste Management

- Air Pollution Control
  - Climate Change and Energy Management
4. Social Goals
  5. Operating Strategies
  6. Metacognition

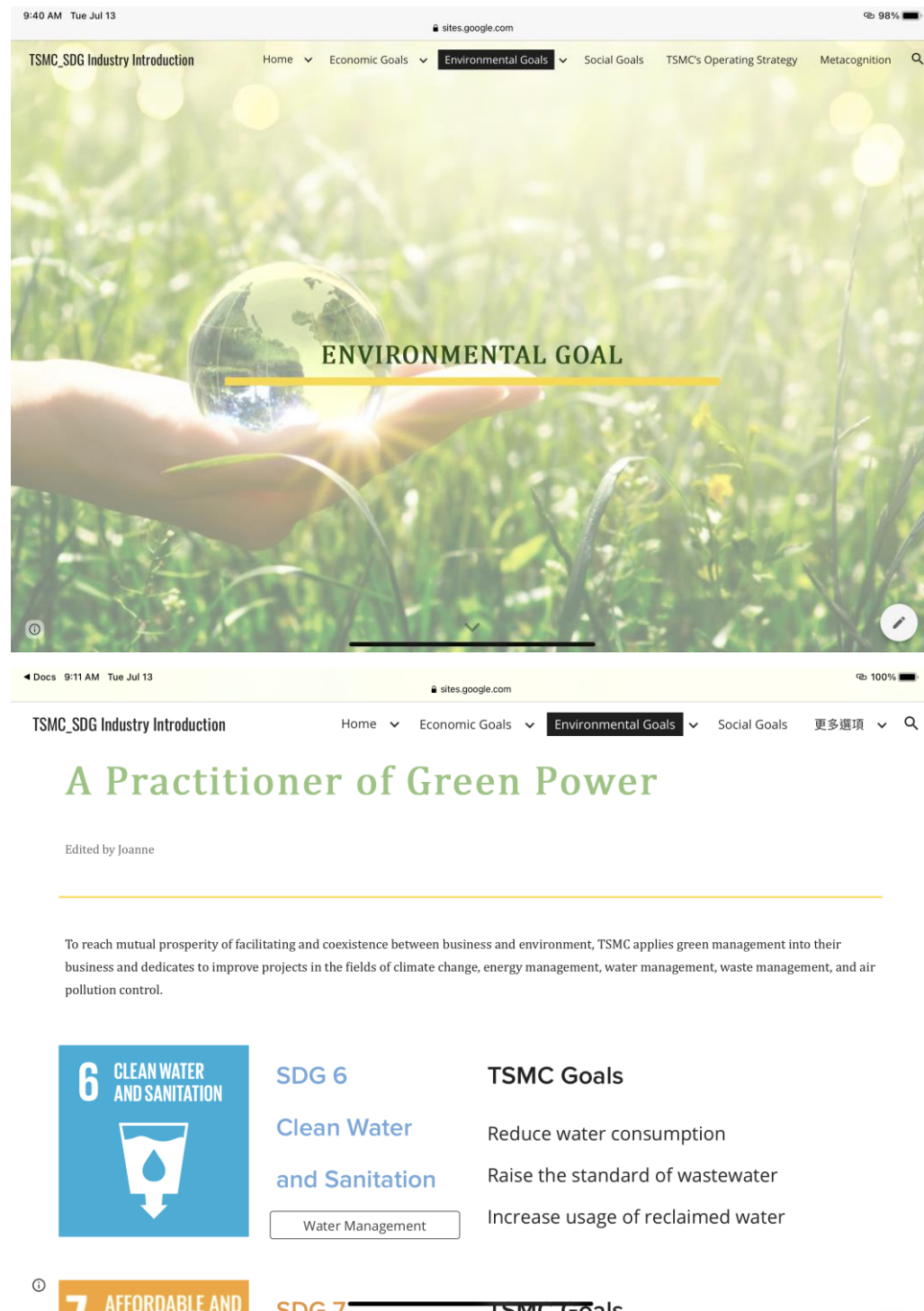
## B. My Main Focus

Table 1. List of Links to My Google Site Production of the Apps/Software Adopted

Apps/Software	<p>Canva  <a href="https://www.canva.com/design/DAEgx2CXN3o/86z0XcsEg3QGooVrIXGc7w/view?utm_content=DAEgx2CXN3o&amp;utm_campaign=designshare&amp;utm_medium=link&amp;utm_source=publishsharelink">https://www.canva.com/design/DAEgx2CXN3o/86z0XcsEg3QGooVrIXGc7w/view?utm_content=DAEgx2CXN3o&amp;utm_campaign=designshare&amp;utm_medium=link&amp;utm_source=publishsharelink</a></p> <p>Infogram  <a href="https://infogram.com/untitled-dashboard-1hzj4o3p0d0mo4p?live">https://infogram.com/untitled-dashboard-1hzj4o3p0d0mo4p?live</a>  <a href="https://infogram.com/untitled-infographic-1hdw2jpxnwqxj2l?live">https://infogram.com/untitled-infographic-1hdw2jpxnwqxj2l?live</a></p> <p>Powtoon  <a href="https://www.powtoon.com/c/dLVtWfwKM2J/1/m">https://www.powtoon.com/c/dLVtWfwKM2J/1/m</a>  <a href="https://www.powtoon.com/c/dJ3N19KFUJi/1/m">https://www.powtoon.com/c/dJ3N19KFUJi/1/m</a>  <a href="https://www.powtoon.com/ws/cs5zQYyaOVu/1/m">https://www.powtoon.com/ws/cs5zQYyaOVu/1/m</a></p>
Google Site	<a href="https://sites.google.com/view/introducing-tsmc/home?authuser=0">https://sites.google.com/view/introducing-tsmc/home?authuser=0</a>

Fig. 1: Google Site \_ Environmental Goal main page

<https://sites.google.com/view/introducing-tsmc/environmental-goals?authuser=0>



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TSMC\_SDG Industry Introduction Home Economic Goals Environmental Goals Social Goals TSMC's Operating Strategy Metacognition

**SDG 6**  
Clean Water and Sanitation

Water Management

**TSMC Goals**

- Reduce water consumption
- Raise the standard of wastewater
- Increase usage of reclaimed water

**SDG 7**  
Affordable and Clean Energy

Waste Management  
Air Pollution Control

**TSMC Goals**

- Aim for energy-efficient production
- Encourage suppliers to conserve energy
- Adopt renewable energy

**SDG 13**  
Climate Action

Climate Change and Energy ...

**TSMC Goals**

- Implement strategies in response to climate risks
- Enhance the resilience against climate risks

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<https://www.tsmc.com/csr/en/focus/greenManufacturing/waterManagement.htm>  
<https://esg.tsmc.com/csr/en/focus/greenManufacturing/climateChangeAndEnergy.html>

**Figures/Images**  
<https://www.tiny.cc/Pages/Water.aspx>  
<https://phys.org/news/2021-04-clock-climate-california-giant-carbon.html>  
<https://recycling.mtsu.com/industries/waste-recycling/waste-to-fuel/>  
<https://www.as.com/why-your-institution-should-still-be-prioritizing-its-sustainability-efforts-during-the-pandemic/>  
<https://www.gd.com/story/climate-change-david-spratt>  
<https://color-hex.org/color/>

**More multimedia**  
**Canva**  
[https://www.canva.com/design/DAEg2CXN3o/86z0XcEg3QGoV1XGc7w/view?utm\\_content=DAEg2CXN3o&utm\\_campaign=designshare&utm\\_medium=link&utm\\_source=publishsharelink](https://www.canva.com/design/DAEg2CXN3o/86z0XcEg3QGoV1XGc7w/view?utm_content=DAEg2CXN3o&utm_campaign=designshare&utm_medium=link&utm_source=publishsharelink)

**Infogram**  
<https://infogram.com/untitled-dashboard-3nj4o3o0d0m4p7iye>  
<https://infogram.com/untitled-infographic-3hdw2jxwqx2i7iye>

**Powtoon**  
<https://www.powtoon.com/c/dLWfwKM2j1m>  
<https://www.powtoon.com/c/gJ3N79KFUj1m>  
<https://www.powtoon.com/vs/cs5zQ7yaQVU1m>

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製作人:

蘇玟瑜 Susan 406382573 (economic goals/ using Google Site, Infogram, Canva, Powtoon, Quizizz)

林宏穎 Neil 405110715 (operating strategy/ metacognition; using infogram, powtoon, google site)

周佩欣 Zoey 406110255 (What is SDG?/ What about TSMC?/ using Google Site, Infogram, Canva, Powtoon, Quizizz)

李其芸 Dorry 406110516 (Social Goals/ Google Site, Canva, Infogram)

李菊萱 Joanne 406110425 (Environmental Goals/Google Site, Infogram, Canva, Powtoon)

This is the main page of my part, environmental goals of TSMC. To have the viewers get the impression of the theme, I chose green as the main color tone. I would like to build a clean visual, so I only placed the SDG goals regarding green manufacturing on this page and navigate the viewers to subpages for elaborated information.



Fig.2 Subpage1\_SDG6 strategies \_ Water Management

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## WATER MANAGEMENT

TSMC has established various water recycling applications through water resource risk management, expansion of diverse water sources, and the development of pollution prevention techniques in order to maximize efficient water use throughout the water cycle in its facilities. In 2019, the Company took further steps to regulate the water management framework of its facilities to ensure the reasonable allocation of facility water resources in response to seasonal temperature changes.

[Reference](#)

### 1. Risk management of water resources

- Comprehensive Information Network and Meticulous Water Balance Calculation
- Smart Management of Recycled Water
- Improving Water Efficiency and Strengthening Facility Water Reclamation Measures

TSMC  
Main Water Cell and On-site Recycling System  
Simplified Version

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TSMC  
Main Water Cell and On-site Recycling System  
Simplified Version

Water Supply Diversity Water Efficiency Management Wastewater Resource Recycling

Annual Additional Water Conserved  
3,280,000

### 2. Develop diverse water sources

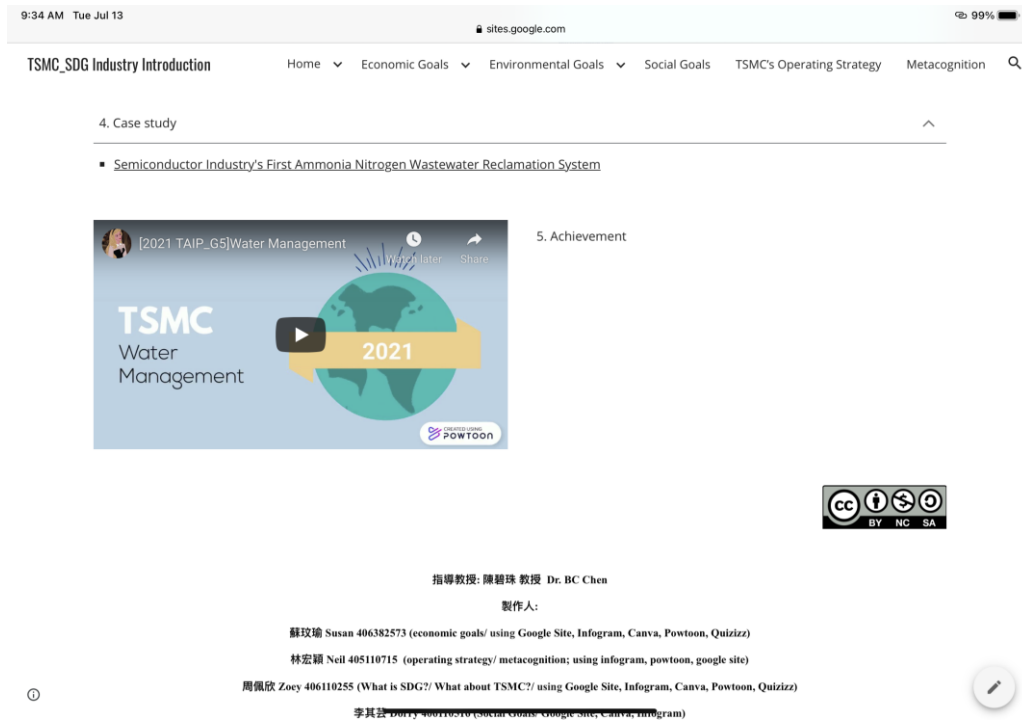
- Adopting Domestic & Industrial Reclaimed Water to Reduce City Water Consumption
- Implement water conservation and the use of regenerated water in the manufacturing process

### 3. Develop Preventive Measures

- Improve the efficiency of water pollution prevention and removal of water pollutants
- Effective Source Distribution Management and Treatment Facilities
- Wastewater Quality improvement

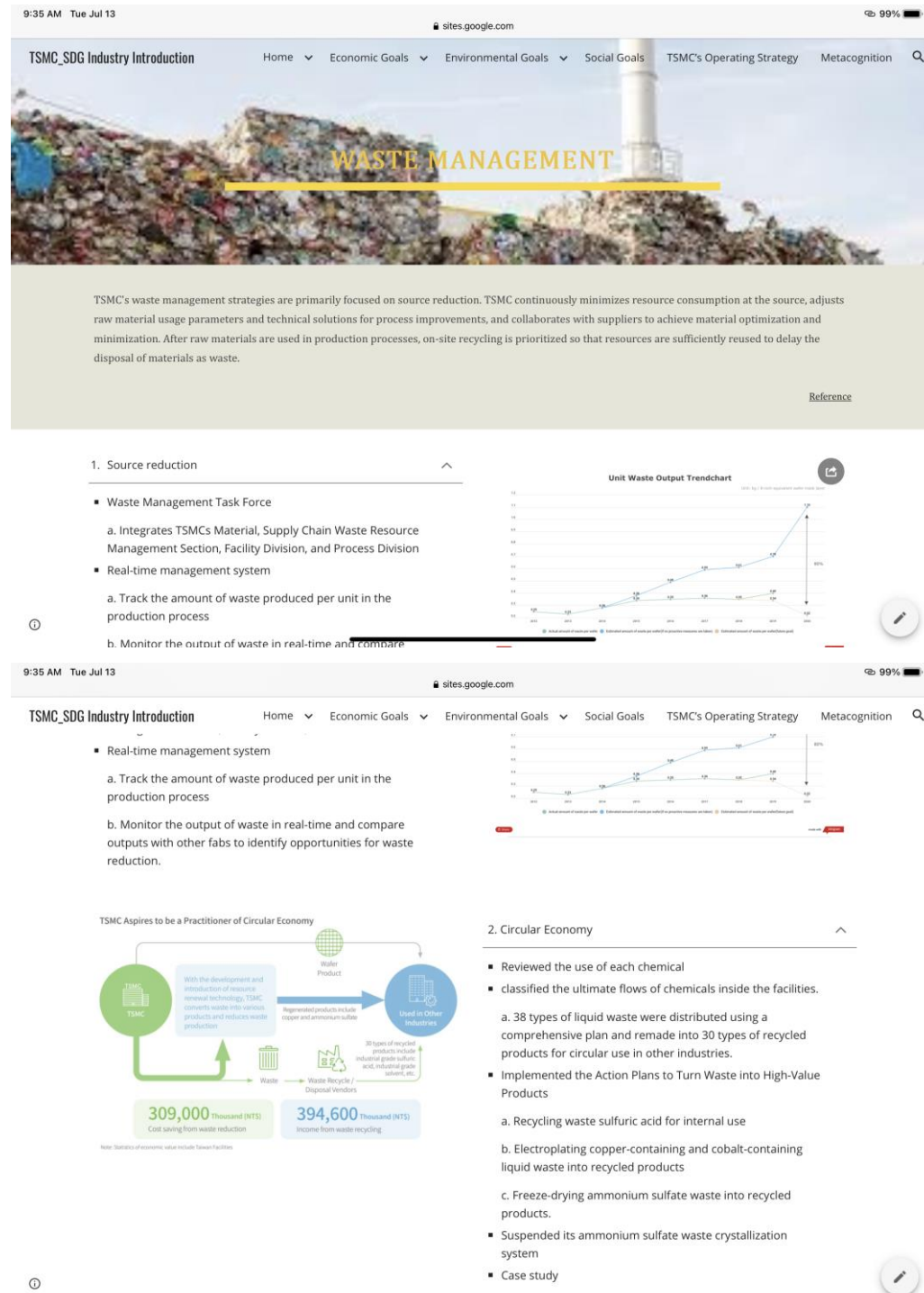
TSMC  
Wastewater classification and recycling system  
Simplified Version

38 9 13 9



After clicking on the bottom saying “Water Management ” on the main page, the viewers will open this subpage. On this page, the information is all about the water management of TSMC, which are the strategies of how they achieve SDG 6. To elaborate on the smart management water recycle system, I made some infographics with Canva and Infogram. Also, in order not to show a plain timeline of TSMC’s achievement, I made a short video with Powtoon.

Fig. 3 Subpage2\_SDG7 strategies \_ Waste Management





After clicking on the bottom saying “Waste Management” on the main page, the viewers will go to this subpage. On this page, the viewers can get to know how TSMC does their waste management, which plays an important role in green manufacturing. Here I only made one chart with Infogram by myself, while other infographics are from the official report of TSMC. The reason I did not choose to make all the infographics myself was because I thought the images from the official report were clearer to the viewers. I tried to make them myself but I failed to produce a better

result than that. Also, in this page, I added a photo of workers as a background of collapsible text to make the page look more vivid.

Fig. 4 Subpage3\_SDG7 strategies \_ Air Pollution Control

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## TSMC\_SDG Industry Introduction

Home Economic Goals Environmental Goals Social Goals TSMC's Operating Strategy Metacognition

# AIR POLLUTION CONTROL

TSMC is committed to reducing air pollution. In addition to compliance with the "Air Pollution Control and Emissions Standards for the Semiconductor Industry" and "Stationary Pollution Source Air Pollutant Emissions Standards" in Taiwan, TSMC's air pollution prevention practices include the adoption of best available technology, such as source categorization and multi-station treatment, as well as continuous collaboration with industry experts to improve the effectiveness of terminal prevention facilities so that concentrations of pollutants emitted to the atmosphere can be equal to or less than governmental standards.

[Reference](#)

### 1. Use Best Available Technology (BAT)

- Prevention strategy
  - Effective reduction of emission from sources
  - Strengthened management of terminal prevention facilities

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### Local Scrubber Categories

Process Type	Semiconductor Manufacturing Process	Target Pollutants	Technology	Equipment Products	Reduction Rate	Real-time Monitoring Parameters
Dry Process	Etched Dry Etching	Corrosive Gases (HCl, H <sub>2</sub> SO <sub>4</sub> )	Burn Wet		>99%	<ul style="list-style-type: none"> <li>Natural Gas Flow</li> <li>Oxygen Flow</li> <li>Circulating Water</li> <li>Initial Pressure</li> </ul>
	Dry Etching	Corrosive Gases (HCl, H <sub>2</sub> SO <sub>4</sub> )	Plasma Wet		>95%	<ul style="list-style-type: none"> <li>Current</li> <li>Power</li> <li>Circulating Water</li> <li>Initial Pressure</li> </ul>
	Thin Film Diffusion Sputtering	Corrosive Gases (HCl, H <sub>2</sub> SO <sub>4</sub> )	Thermal Wet		>95%	<ul style="list-style-type: none"> <li>Reactor Temperature</li> <li>Circulating Water</li> <li>PH Value</li> <li>Initial Pressure</li> </ul>
	Ion Implantation Sputtering Epitaxy	Toxic Gases	Absorption		>95%	<ul style="list-style-type: none"> <li>Pressure Difference in Scrubber</li> <li>Initial Pressure</li> </ul>
Wet Process	Thin Film	High Boiling Point Organics	High Temperature Thermal + Wet		>90%	<ul style="list-style-type: none"> <li>Reactor Temperature</li> <li>Circulating Water</li> <li>Filter</li> <li>Initial Pressure</li> </ul>
	Wet Etching	Corrosive Gases Organic Gases	Wet (Process Site)		>95%	<ul style="list-style-type: none"> <li>Pressure Difference in Scrubber</li> <li>Circulating Water</li> <li>Initial Pressure</li> <li>PH Value</li> </ul>
Organic Process	PM Striping	High Boiling Point Organics	Condensation		>95%	<ul style="list-style-type: none"> <li>Pressure Difference in Scrubber</li> <li>Condensation Temperature</li> </ul>
	Chemical Storage	Corrosive Gases	Wet (Facility Site)		>95%	<ul style="list-style-type: none"> <li>Pressure Difference in Scrubber</li> <li>PH Value</li> <li>Circulating Water</li> <li>Initial Pressure</li> </ul>

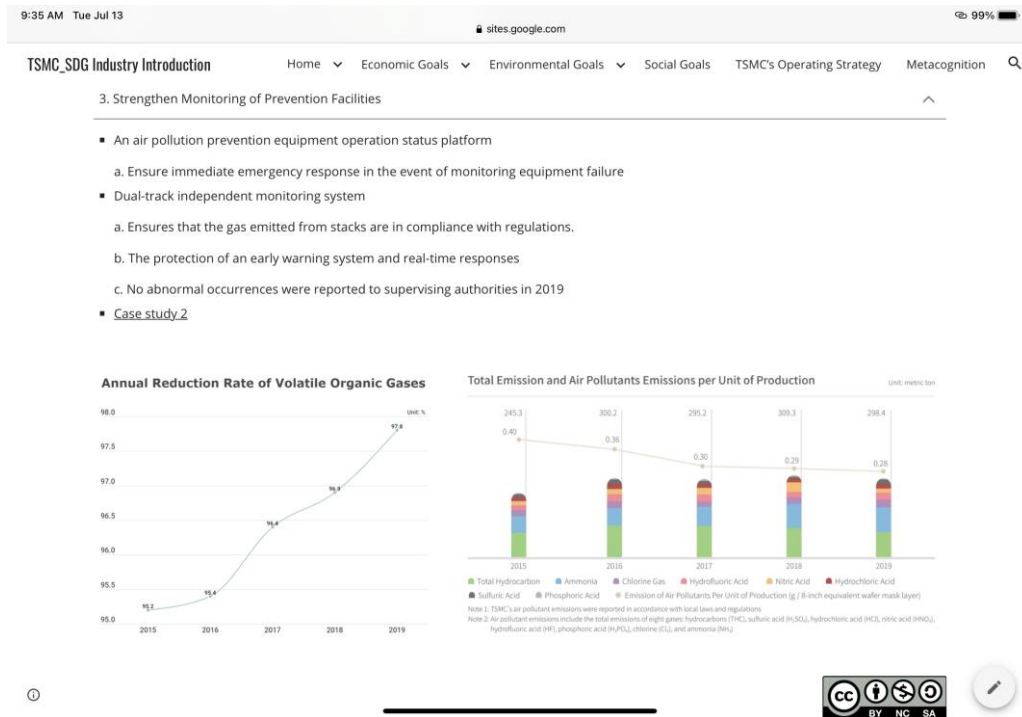
### 2. Effective Reduction of Emission from Sources-Local Scrubbers

- The different properties of pollutants in high concentration waste gases emitted from fab equipment
- 7 types of local scrubbers
  - 1) thermal 2) combustion 3) plasma 4) wet type in facility site 5) wet type in process site 6) adsorption 7) condensation.
- New plants (plants built after Fab 15 Phase 7)
  - Independent central scrubber
  - Washing towers for wet process equipment → emits a large amount of acidic (酸性氣體) and caustic gas (鹼性氣體)
  - High-Efficiency Central Scrubbers
- Continuous Improvement of Prevention Technology
- Case study 1

### 3. Strengthen Monitoring of Prevention Facilities

- An air pollution prevention equipment operation status platform
  - Ensure immediate emergency response in the event of monitoring equipment failure
- Dual-track independent monitoring system
  - Ensures that the gas emitted from stacks are in compliance with regulations

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After clicking on the bottom saying “Air Pollution Control” on the main page, the viewers will go to this subpage. To achieve SDG7, TSMC also works hard on air pollution control, aiming to reduce toxic or harmful gas that harms not only human beings and the environment. To elaborate the process of how TSMC operates their air pollution prevention, I made a short film with Powtoon. Moreover, I visualized some statistics with Infogram so that the viewers can read them more easily.



## Subpage5\_SDG13 strategies \_ Climate Change and Energy Management

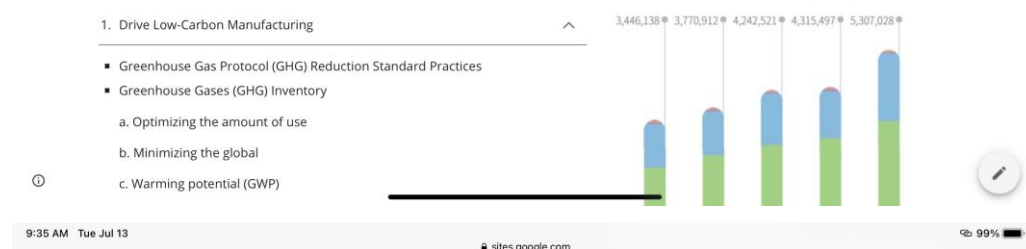
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## CLIMATE CHANGE AND ENERGY MANAGEMENT

In the face of a changing global climate, TSMC has not only strengthened its resilience to climate change, but also made preparations to lessen the possible impact disasters could have on operations and made efforts to reduce greenhouse gas emissions. As declared in the Corporate Social Responsibility Policy and Environmental Protection Policy, responding to climate change is the responsibility of a sustainable business. TSMC faces the harsh challenges of climate change in collaboration with business partners, academia, government, and all of society by continuing to use energy more efficiently and by using renewable energy. TSMC strives to become a world leader in green production.

[Reference](#)

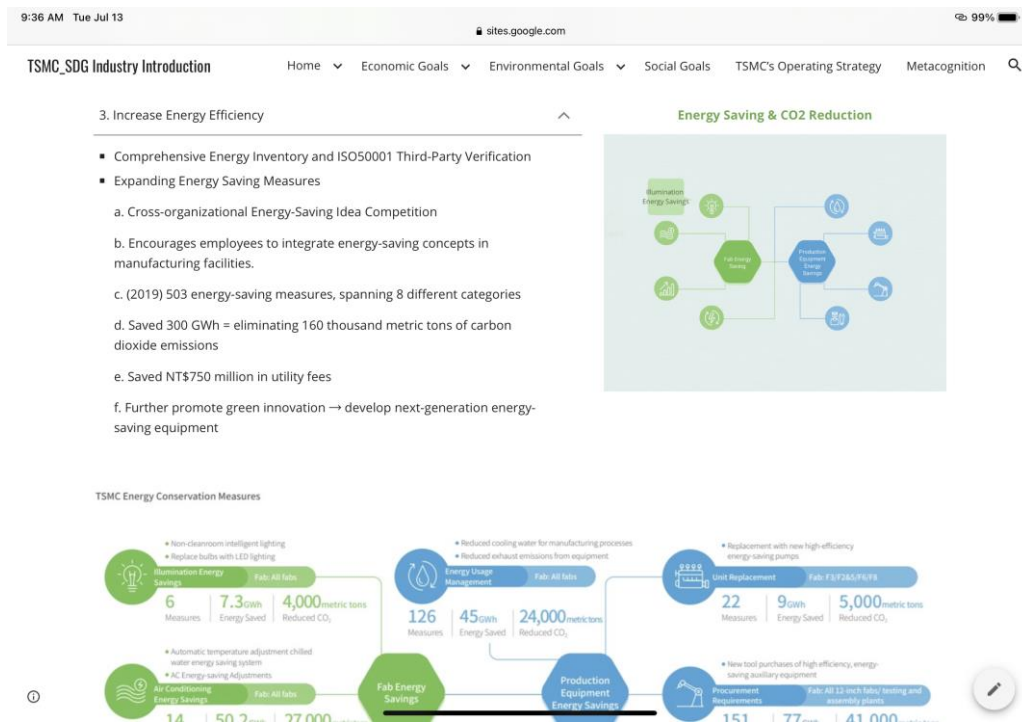
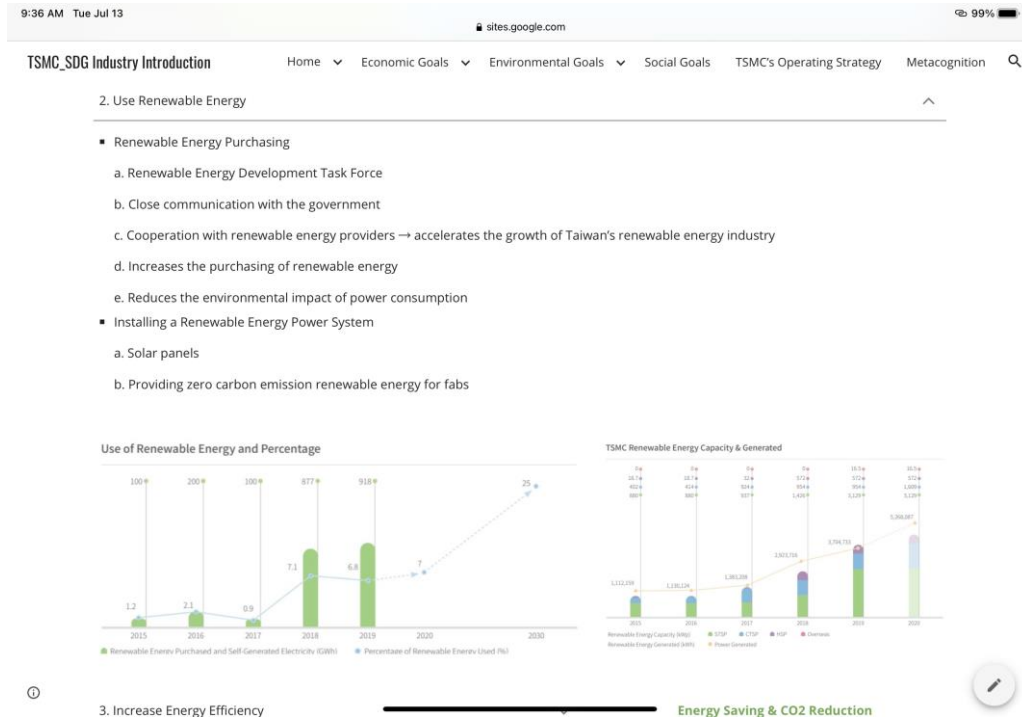


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### GHG Reduction Standard Practices

TSMC Standard Practices		2019 Implementation Status	
Scope 1 Direct GHG Emissions	ISO 14064-1 inventory and third party verification	100%	All fabs and subsidiaries underwent inventory and third party verification
	Optimization of gas quantity used in production	100%	100% introduced GHG-optimized process parameters in accordance with the manufacturing specifications of the Intelligent Engineering Center
	Substitute high global warming potential (GWP) fabrication gases	100%	All 12-inch fabs are now using optimized carbon reduction technology - remote plasma dissociation of nitrogen trifluoride (NF <sub>3</sub> ), while 6-inch and 8-inch fabs are using nitrogen trifluoride (NF <sub>3</sub> )/octafluorobutane (C <sub>4</sub> F <sub>8</sub> )
	Install Point-Of-Use abatement equipment for fluorinated GHGs	100%	Installed 1,500 POU abatement equipment on new process tools using F-GHG in new and existing fabs (including subsidiaries); Continued to replace and upgrade 111 POU abatement equipment in existing fabs, with installation rate increased to 90%
	Continue to develop on-site nitrous oxide removal technology	5	Continued to develop removal technology, and types of certified equipment increased from 3 to 5; After inclusion as new standard equipment in 2018, new comprehensive equipment was installed in Fab 18
Scope 2 Indirect GHG Emissions	ISO 50001 energy management and third party verification	100%	The Company underwent ISO 50001 inspection and third party verification; 100% of facilities in Taiwan completed third party verification in 2019
	Construct green buildings	1	The Company leads the global semiconductor industry with the largest LEED-certified building area and constructed two more fabs, which received LEED certification and EEW green architecture certification. In total to date, 32 buildings have received LEED certifications and 23 buildings received EEW certifications
	Energy efficiency standards	503	Energy efficiency of advanced-technology fab tools leads industry peers, with 503 energy-saving measures implemented and 300 GWh saved
	Next generation fab tools use energy-saving, carbon-reducing designs	1	Launched an energy conservation project for next-generation fab tools, and in 2019, implemented 110 energy saving projects for 54 process tools. Four vendors completed energy-saving certification for 27 process tools
	Introduce renewable energy	910 GWh	Leading semiconductor manufacturer in Taiwan, with 910 GWh of Renewable Energy, Renewable Energy Certificates (REC), & Carbon Credit purchased

Note: Data comparison with industry peers refers to the World Semiconductor Association Report





## TSMC\_SDG Industry Introduction

Home

Economic Goals

Environmental Goals

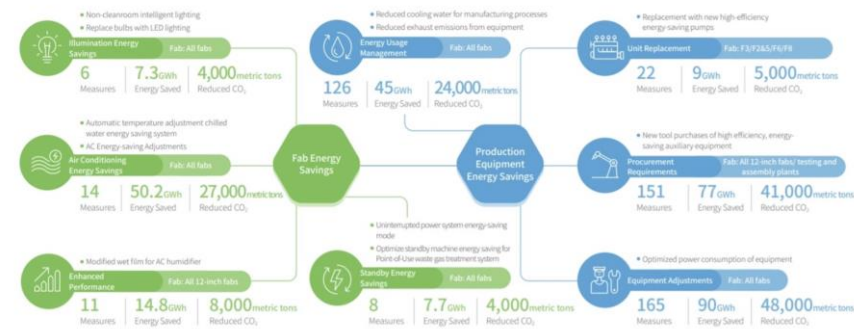
Social Goals

TSMC's Operating Strategy

Metacognition



## TSMC Energy Conservation Measures



## 4. Strengthen Climate Resilience

- Key factors from climate change and extreme weather each year that could affect operations
  - a. Establishes standard guidelines for all fabs to strengthen operational resilience.
  - b. International and domestic green building
  - c. Ecological operation features → architectural designs to promote the co-existence of industrial production and ecological sustainability

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## TSMC\_SDG Industry Introduction

Home

Economic Goals

Environmental Goals

Social Goals

TSMC's Operating Strategy

Metacognition



## 4. Strengthen Climate Resilience

- Key factors from climate change and extreme weather each year that could affect operations
  - a. Establishes standard guidelines for all fabs to strengthen operational resilience.
  - b. International and domestic green building
  - c. Ecological operation features → architectural designs to promote the co-existence of industrial production and ecological sustainability
- Setting an Example to Lead Industry Learning
  - a. Voluntary Greenhouse Gases Emissions Reduction Platform of the Bureau of Industrial Development
  - b. Outstanding Manufacturer for Voluntary Greenhouse Gases Emissions Reduction
  - c. TSMC is the first semiconductor company in Taiwan to receive carbon credits under the TM002 Method
  - d. Optimization measures:
    - e. 6 dimensions of 8 energy-saving measures, such as the 3 energy saving steps of Intelligent chilled water system
    - f. Energy-saving measures for uninterrupted power systems and wafer cleaning hot water recycling systems
- Case study 1
- Case study 2

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TSMC TCFD Framework

Climate Risk and Opportunity Matrix

2019 Actions on Climate Risks and Oppo...



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2019 New Fab in Compliance

TSMC TCFD Framework

Climate Risk and Opportunity Matrix

2019 Actions on Climate Risks and Oppo...

5. Achievement

[2021 TAIP\_G5]TSMC Climate Change

TSMC Climate Change and Energy Management

Watch on YouTube

POWTOON

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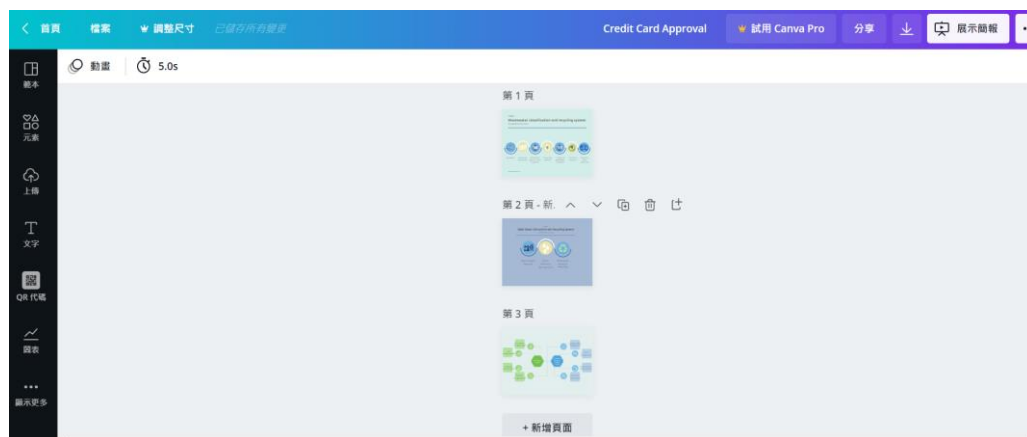
Lastly, after clicking on the bottom saying “Climate Change and Energy Management” on the main page, the viewers will go to this subpage. According to TSMC’s official report, they combine climate change and energy management together. Therefore, I followed the report and did not divide them into two parts as well. I did not make many infographics on my own here that only one of the images was made with Canva. I also made a short film with Powtoon to show TSMC’s achievement in the field.

### C. Self-Evaluation of the Group Project

My role in this group project was to introduce the environmental goals regarding the SDG of TSMC. In the beginning, we had some disagreement on what content to include in our project. One of our members wanted to include a comparison of TSMC and other companies, but I did not agree with her. I thought that might distract the focus of our purpose to introduce TSMC, and I conveyed my opinion this time. Eventually, we decided to include the comparison part in each person's work if we thought it was necessary. Most of the time our group did a great job working on our own and we always had a quick conclusion during the meetings, that everyone was clear about what they were responsible for. Overall, I was glad to work with our group with such efficiency.

### III. Apps and Software Adopted in the Group Project (include screenshots)

#### 【Canva】

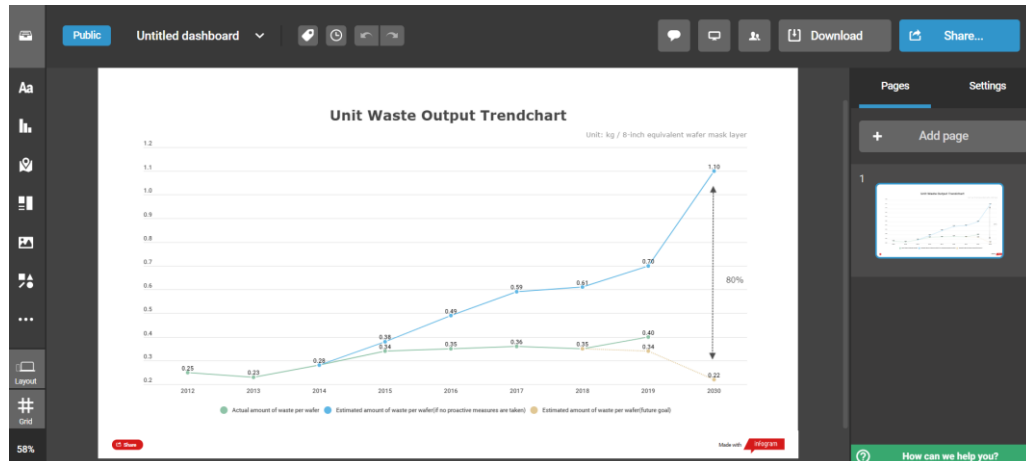


[Link to full works](#)

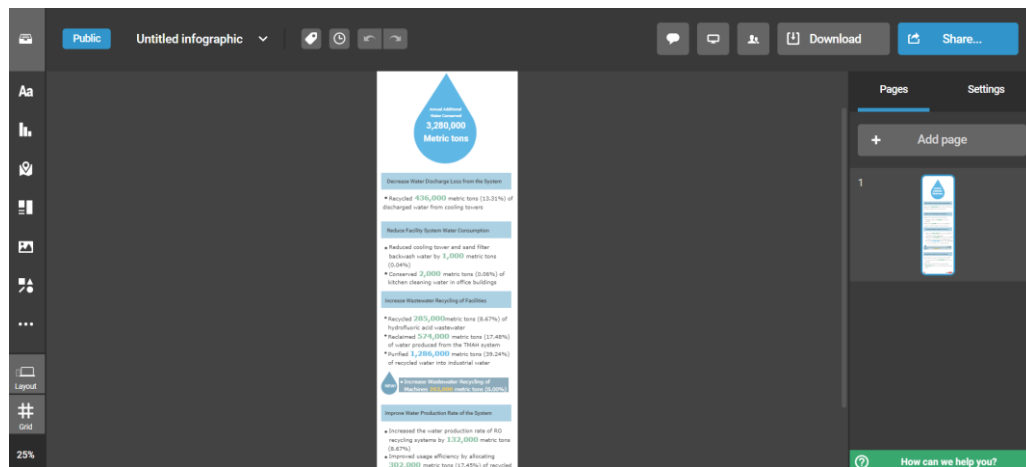
I decided to use Canva for it has a complete function and many elements allowing the users to apply to their works. Also, I did not need to spend a lot of time making an infographic with Canva. Usually when I use Canva to make flowcharts, or to describe something without exact statistics. With Canva I can

always produce aesthetic visual aids, but not infographics with statistics because Canva does not provide a very convenient function dealing with datas.

## 【Infogram】



[Link to full work](#)



[Link to full work](#)

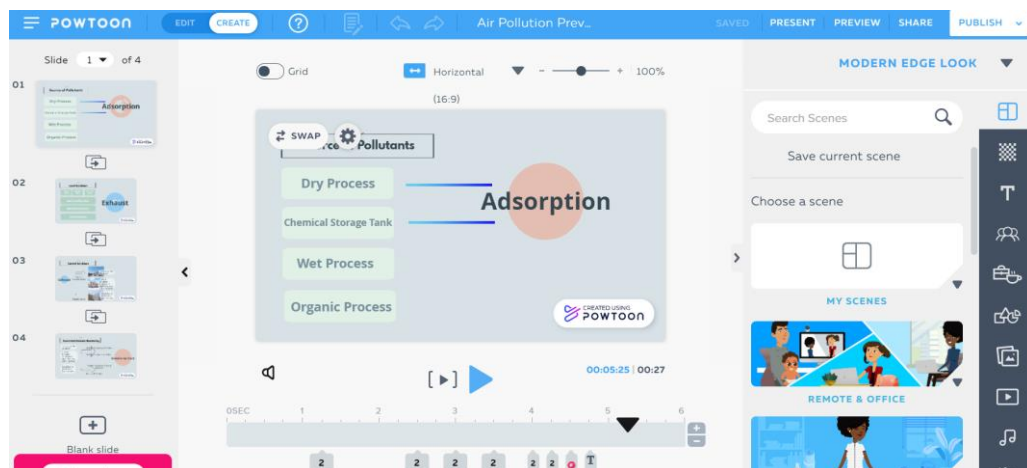
I chose to use Infogram when I needed to show a chart with statistics or when I would like to make a long-sized infographics. Infogram provides a better function dealing with data that I find very convenient. It can also customize the chart property that makes the charts clear and informative. Also, in Google Site, I could also insert the Infogram that saved a lot of space. However, Infogram does not provide enough elements or sources for free, only when I pay that I can enjoy the complete functions like downloading the file or have more templates to use.

## 【Powtoon】



[Link to full work](#)

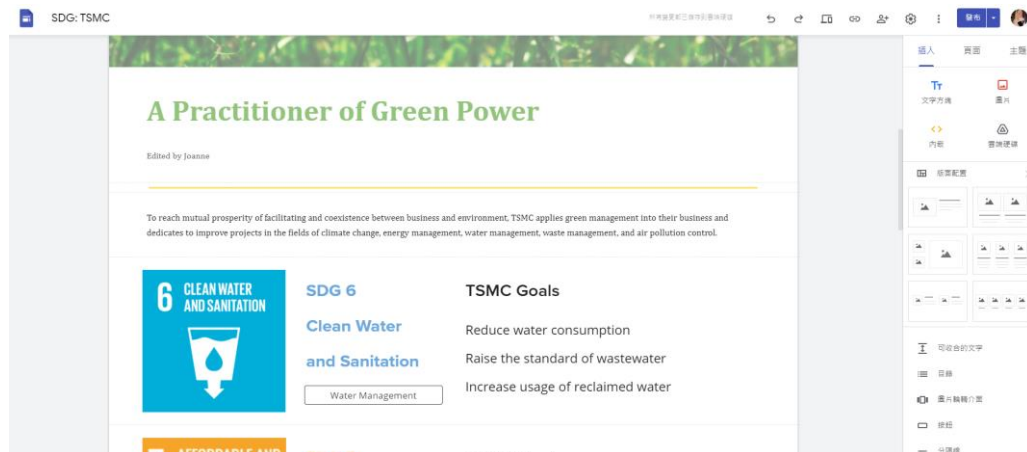
[Link to full work](#)



[Link to full work](#)

I applied Powtoon to the project because it was the only tool I knew that could make films. Sometimes graphics are not enough to show the full content, then I would like to present the content with video. Powtoon has enough elements and functions for one to make an easy video; however, it functions so slowly that the time it takes to finish one film is too long.

## 【Google Site】



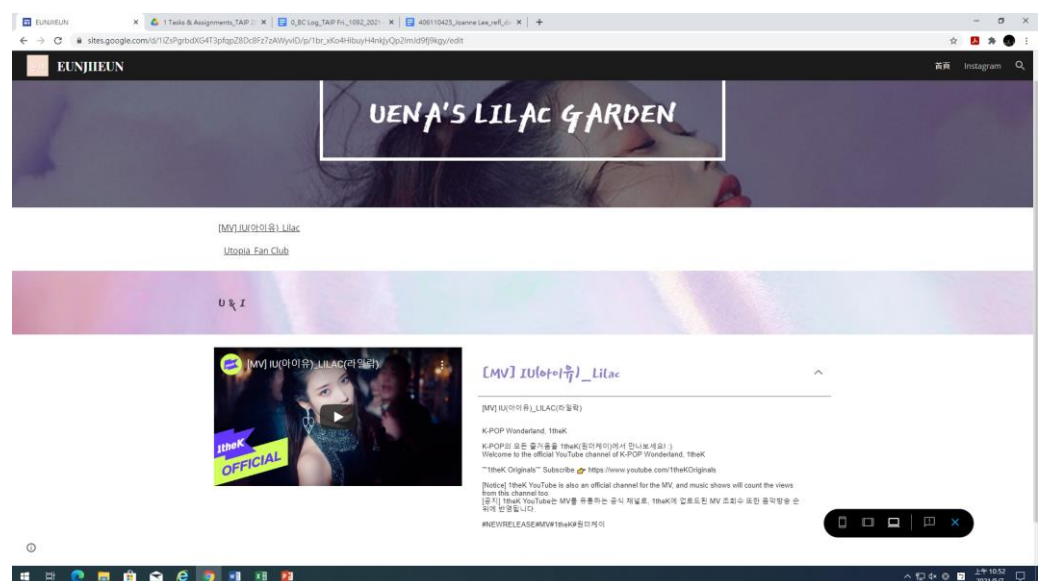
Google site was the main platform we used in our final project. Google Site was convenient and easy to understand since it did not take much effort to learn and get used to using the function to build a fine website. Editing with group members at the same time was also beneficial for corporations.

## IV. When I First learned the Apps/Software/Platform

### A. Week 11 - Google Site

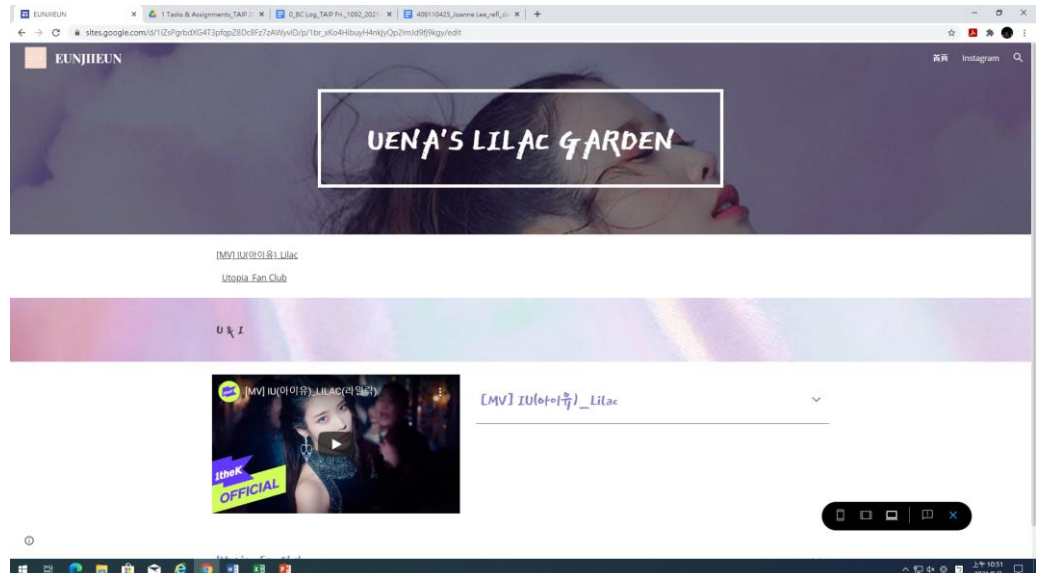
#### i. In-class Practice

<https://sites.google.com/view/week11practice/%E9%A6%96%E9%A0%81?authuser=0>

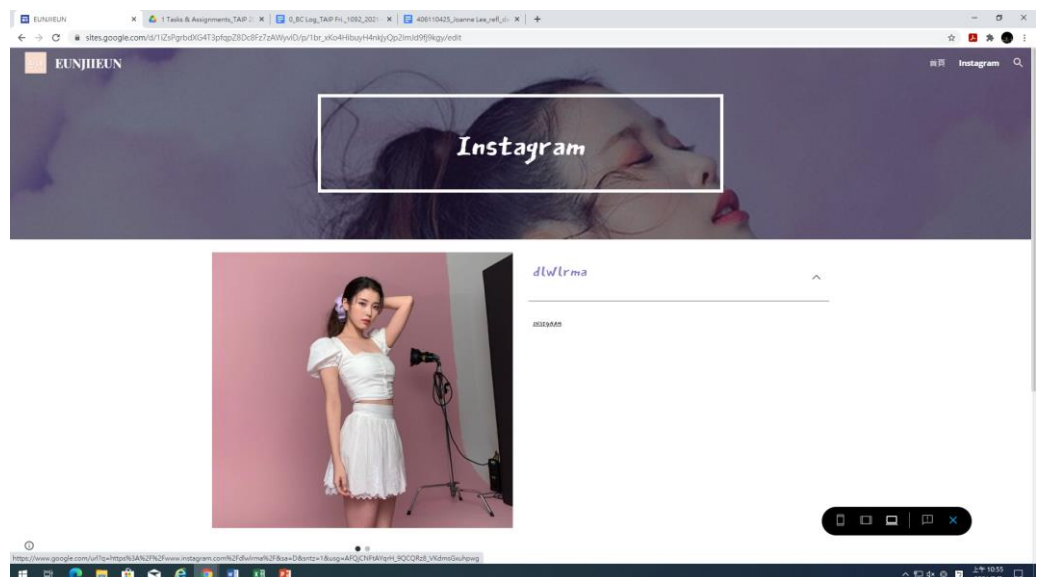


- Main page of the website





- Collapsible words
- Saving the space of many words, creating a clearer visual



- Editing a Sub-page
- Adding Image Carousel function: the viewers can swipe multiple images at the same section

## ii. Weekly Reflection

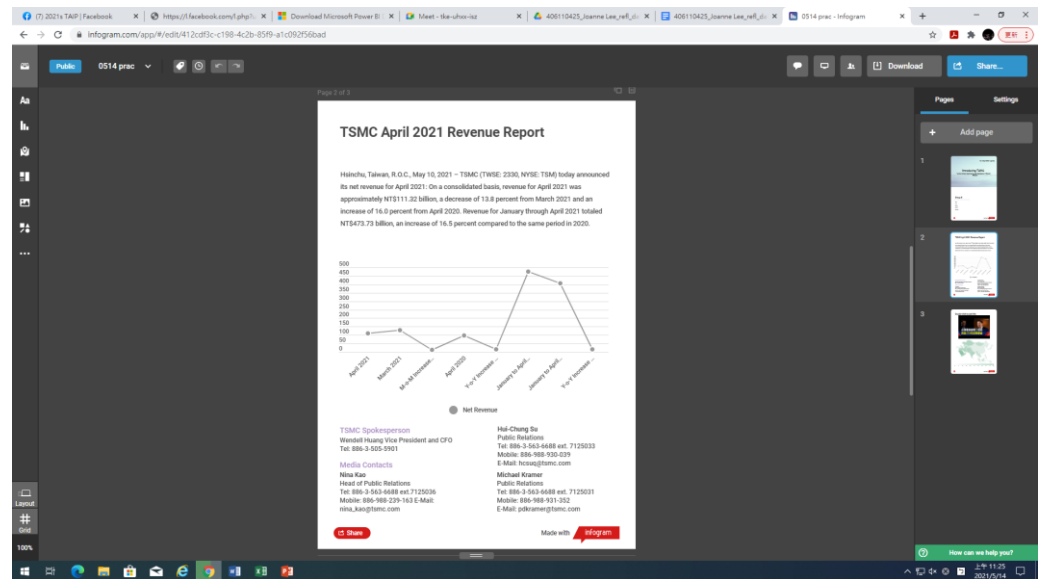
I think the group did a great job on instructing us to form a Google site.

I made a Website about IU, a famous Korean singer and actress. I did not have any ideas about what the topic should be, so I just came up with some random ideas. Google site is like a platform where you can stock all the Google functions into one Website, which is simple to learn.

## B. Week 12 - Infogram

## i. In-class Practice

<https://infogram.com/0514-prac-1ho16vop5do9x4n?live>

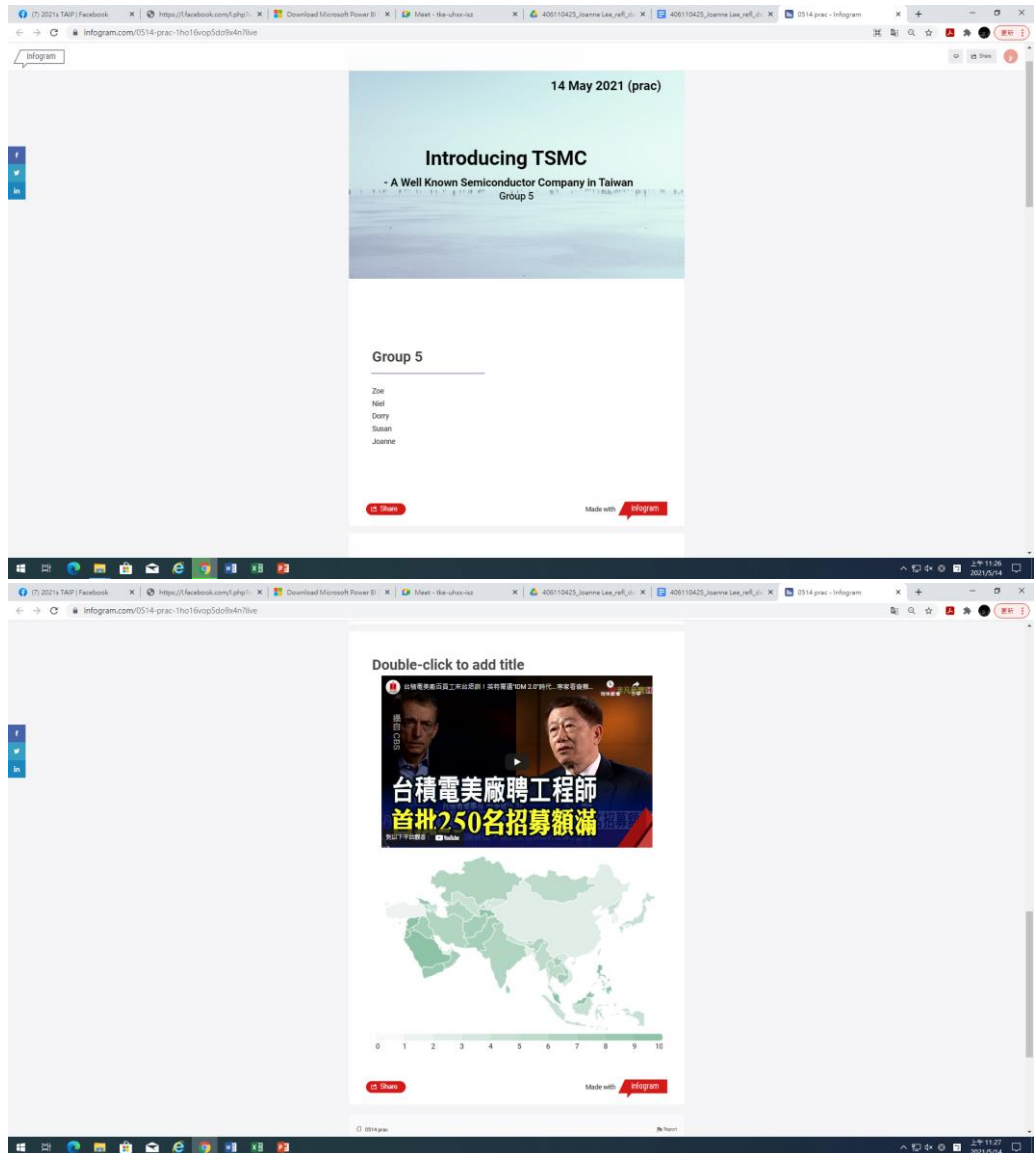


- Editing a chart



- Inserting a YouTube video and map





- Result

- ii. Weekly Reflection

The tutorial was clear but they might want to slow down their pace a little bit. I could not follow along with the practice since they taught too fast. However, I still learnt how to make a chart, inserting a video and editing data on a map.

- C. Week 13 & 14 - Powtoon

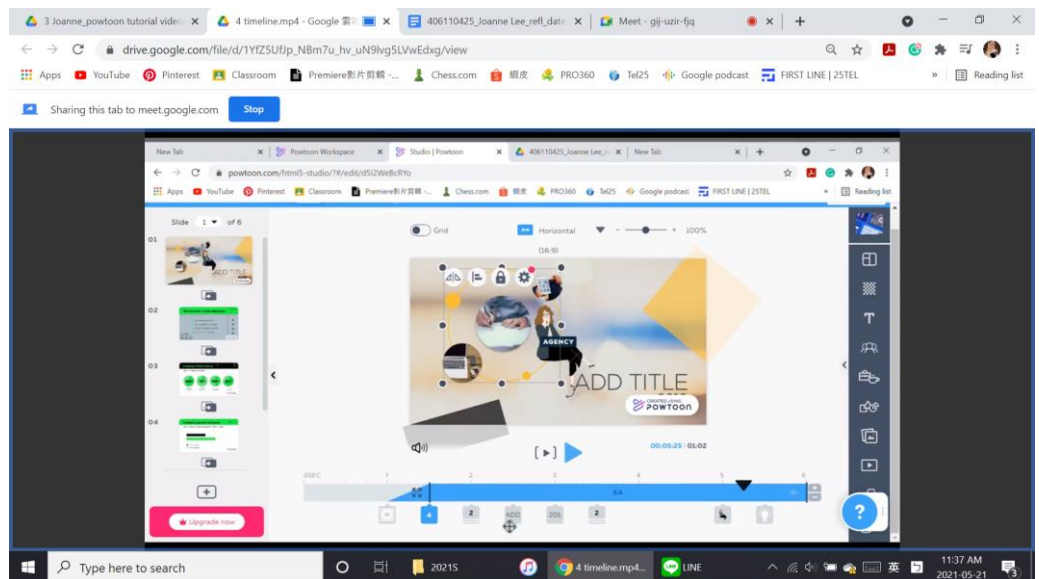
- i. Presentation Videos

<https://drive.google.com/drive/folders/1weynyFjI0PH2dfOI4LT0jQoiFpa3hb58?usp=sharing>

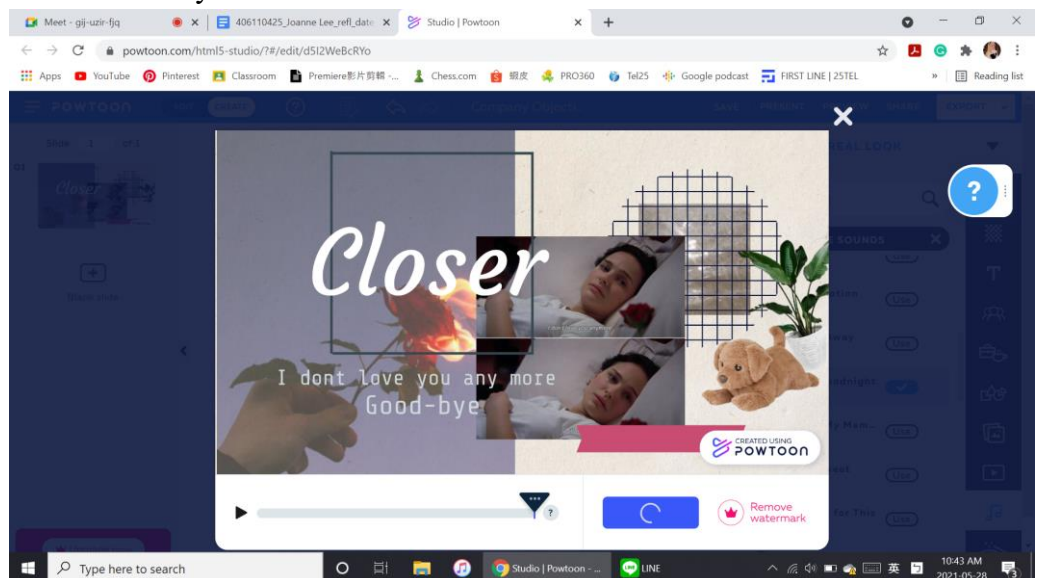
## ii. In-class Practice

<https://www.powtoon.com/s/d5I2WeBcRYo/1/m>

<https://youtu.be/iZMWNfm05bo>



- Sharing the screen and show the video
- First try of this function



- It took forever to download a jpg. file
- Exported the result to YouTube

## iii. Weekly Reflection

I am not very satisfied with my tutorial since I still got nervous even though it's just a video recording! However, I learnt something due to this recording that Windows 10 has its own screen recording function! Because my Evercam was expired and it would not allow me to save

the file into mp4 or wmv, so I needed to figure out some other ways.

<https://youtu.be/mLgT3yZwqgc> Here is the video I found that teaches you how to use it.

Distant-teaching class seems to be a little bit troublesome since my laptop is not so professional and it is old already, sometimes it gets so hot like it's going to burn. I miss the pc at school. They are so nice and fast. But the pros of distant-class is that I don't need to face the crowds, which is nice.

## **V. Conclusion: Reflections and Thoughts for Creating This Project**

During the process of preparing the final project, I learned much about TSMC and got familiar with all the tools I applied on the website. I did not have any chances to learn this deep about TSMC before and only thought about its success in business. However, after doing the research on TSMC's SDG goals and its actions to achieve them, I realized the reasons why it is the most successful enterprise in Taiwan and found its operating spirit respectful. Furthermore, after finishing the project, I am now able to apply multiple media to other projects from other courses, which is quite helpful. I always feel satisfied when seeing the final results of the graphics, videos, and other material all done by myself.

Actually, I had a make-over of my website pages. Though I had spent days preparing the first version of the pages, the result was a huge disappointment. The previous version lacked so much information and the editing were terrible. Therefore, I decided to change everything about it. The first thing I did was to reorganize the whole structure and divided each strategy of achieving SDG into separated subpages. Then I classified the titles into

smaller chunks and added the core information to them. Lastly, I decorated the pages to look clean and aesthetic. I do not think the final result is perfect, but at least it is spot on.

All in all, I am glad and thankful to have the opportunity to know adequate tools available to apply to different tasks from this course. As for those tools I did not use in the project this time, I will like to learn more about them and practice them in the future.

## VI. References (Works Cited - Divide your references into categories)

### A. Text sources

<https://esg.tsmc.com/download/csr/2019-csr-report/english/pdf/e-all.pdf>

<https://esg.tsmc.com/csr/en/focus/greenManufacturing/waterResourceManagement.html>

<https://esg.tsmc.com/csr/en/focus/greenManufacturing/climateChangeAndEnergy.html>

### B. Photo/picture sources

<https://www.tiny.ca/Pages/Water.aspx>

<https://phys.org/news/2021-04-clock-climate-california-giant-carbon.html>

<https://recycling.metso.com/industries/waste-recycling/waste-to-fuel/>

<https://www.qs.com/why-your-institution-should-still-be-prioritizing-its-sustainability-efforts-during-the-pandemic/>

<https://www.gq.com/story/climate-change-david-spratt>

<https://color-hex.org/color>