A Long Way to the Success of "Go Green with Nuclear" 「以核養綠」 Referendum

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Outline

Part I Challenges and Struggles

- Impact of the Fukushima Nuclear Accident
- Rising of Anti-Nuclear Atmosphere
- Electricity Act to Phase out Nuclear Energy
- Struggles to Distributing Correct Information

Part II The Referendum

- Why Going for a Referendum
- Initiation
- Legal Processes
- Planning and Execution
- Victory of “Go Green with Nuclear”
Part I Challenges and Struggles
Impact of the Fukushima Nuclear Accident (1/2)

The Fukushima Nuclear Accident

Source: http://www3.nhk.or.jp/nhkworld/

Shocking images that scared the general public
Part I Challenges and Struggles
Impact of the Fukushima Nuclear Accident (2/2)

- Only one nuclear engineering related academic department in Taiwan
  Department of Nuclear Engineering 1964-1995
  Dept. of Nuclear Engineering and Engineering Physics 1995-1997
  Department of Engineering and System Science 1997-

- Always on the frontline to explain and defend
Part I Challenges and Struggles
Rising of Anti-Nuclear Atmosphere

▶ Anti-nuclear parades every year after the Fukushima accident
▶ Malicious attacks from anti-nuclear groups

https://zh.wikipedia.org/wiki/%E8%87%BA%E7%81%A3%E6%A0%B8%E9%81%A8%E8%A1%8C
https://www.ettoday.net/news/20130312/173780.htm
Part I Challenges and Struggles

Electricity Act to Phase out Nuclear Energy

- New President elected in 2016, Ms. Tsai, Ing-wen of the Democratic Progress Party
- Energy policy of a *Nuclear Free Homeland*
- “The nuclear-energy-based power-generating facilities shall wholly stop running by 2025.” stated in Paragraph 1 of Article 95 in the *Electricity Act*
- Share of Electricity in 2025
  - 50% Natural Gas
  - 30% Coal
  - 20% Renewables
- Complete phase-out of nuclear energy
Part I Challenges and Struggles

Struggles to Distributing Correct Information

- A team of scientists, engineers, and economists formed to act
- Commentary articles in various news media
Part I Challenges and Struggles
Struggles to Distributing Correct Information

- Lectures on nuclear basics at different levels
- Websites of nuclear information sharing
- Fan page and chatting room of “Nuclear Myth Busters” on Facebook
Part I Challenges and Struggles

Struggles to Distributing Correct Information

- Public debates on TV
Part I Challenges and Struggles

Struggles to Distributing Correct Information

- Collaboration with foreign pro-nuclear NGOs

Michael Shellenberger of Environmental Progress
Part II The Referendum
Why Going for a Referendum

- Record-high electricity demand → serious electricity shortage with <6% reserved capacity island wide
- A massive power blackout in August of 2017
- Serious air pollution → forced power reduction in coal-fire plants
- More and more frequent electricity outages in recent years
- A crisis of electricity shortage bound to occur!
# Part II The Referendum

**Why Going for a Referendum**

<table>
<thead>
<tr>
<th>Year</th>
<th>GDP growth</th>
<th>Electricity Generated (billion kWh)</th>
<th>Percentage of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>5.42%</td>
<td>189.7</td>
<td>4.69%</td>
</tr>
<tr>
<td>2006</td>
<td>5.62%</td>
<td>196.6</td>
<td>3.64%</td>
</tr>
<tr>
<td>2007</td>
<td>6.52%</td>
<td>201.9</td>
<td>2.70%</td>
</tr>
<tr>
<td>2008</td>
<td>0.70%</td>
<td>200.2</td>
<td>-0.84%</td>
</tr>
<tr>
<td>2009</td>
<td>-1.57%</td>
<td>193.6</td>
<td>-3.30%</td>
</tr>
<tr>
<td>2010</td>
<td>10.63%</td>
<td>207.4</td>
<td>7.13%</td>
</tr>
<tr>
<td>2011</td>
<td>3.80%</td>
<td>213.0</td>
<td>2.70%</td>
</tr>
<tr>
<td>2012</td>
<td>2.06%</td>
<td>211.7</td>
<td>-0.61%</td>
</tr>
<tr>
<td>2013</td>
<td>2.23%</td>
<td>213.4</td>
<td>0.80%</td>
</tr>
<tr>
<td>2014</td>
<td>3.74%</td>
<td>219.2</td>
<td>2.72%</td>
</tr>
<tr>
<td>2015</td>
<td>0.72%</td>
<td>219.1</td>
<td>-0.05%</td>
</tr>
<tr>
<td>2016</td>
<td>1.50%</td>
<td>225.8</td>
<td>3.06%</td>
</tr>
<tr>
<td>2017</td>
<td>2.60%</td>
<td>231.1</td>
<td>2.35%</td>
</tr>
</tbody>
</table>
Part II The Referendum

Why Going for a Referendum

Days of Insufficient Reserved Capacity in Recent Years
(Percentage of Daily Reserved Capacity <6%)

2014: 9
2015: 32
2016: 80
2017: 104
Part II The Referendum

Why Going for a Referendum

Academics offer officials advice over power situation

By Tan Wei-cheng / Staff reporter

Chung-Hwa Nuclear Society academics on Friday said that authorities should not rule out the use of nuclear energy, citing slow development of “renewable” energy solutions, despite Premier Lin Chuan saying that a restart of reactors was “impossible.”

Government offices were under Executive Yuan orders to turn off air-conditioners between 1pm and 3pm for two weeks after damage to a Ho-Ping Power Co. transmission tower in Yilan County affected the nation's power supply.

The measure was lifted early amid a public outcry.

Representatives of the Chung-Hwa Nuclear Society hold a news conference in Taipei on Friday urging the government to resolve the electricity shortage with nuclear power.

Photo: Tan Wei-sheng, Taipei Times
Part II The Referendum

Why Going for a Referendum

People walk on a street during a massive power outage in Taipei on Aug. 15. | REUTERS

BUSINESS

Taiwan blackout affects millions of households amid stifling summer heat

REUTERS

TAIPEI - Taiwan suffered a massive power blackout on Tuesday evening that hit businesses and residential homes, affecting close to 7 million households on the heavily industrialized island amid sweltering heat.
Part II The Referendum
Why Going for a Referendum

The largest coal-fired plant at central Taiwan with a total installed capacity of 5,780 MW

*Industrial pollution* is still a serious problem in Taiwan.

Part II The Referendum
Why Going for a Referendum

- An electricity share by nuclear down from 19% to 9% in 3 years (2015-2017)
- Bold and impractical planning of electricity shares by 50% natural gas, 30% coal, and 20% renewables in 2025
- More importantly, the government claims that going for a nuclear free homeland is a **national consensus**.

**Nuclear energy cannot be phased out by 2025!**

*Is it true that there is a national consensus?*
Part II The Referendum
Initiation

During the 31-1st Board Meeting of Directors and Supervisors of Chung Hwa Nuclear Society on January 10th of 2018, the chairman of the board proposed to go for a referendum.

The theme of this referendum would focus on repealing Paragraph 1 of Article 95 in the Electricity Act.

The campaign slogan:
“Go Green with Nuclear”
Part II The Referendum
Legal Processes

Thanks to the revised Referendum Act, signatures and votes of 1/10000, 1.5%, and 25% of the number of legitimate voters (~18.78 millions) from the last presidential election are required for different phases of a referendum.

https://www.cmmedia.com.tw/home/articles/12455
Part II The Referendum
Legal Processes

Three phases of work to complete for a referendum to pass

1. Signature collection for proposing the referendum and preparation of the subject text
   > 1,879 proposing signatures

2. Signature collection for endorsing the referendum
   > 281,745 endorsing signatures

3. Final nation-wide voting
   > 4,939,267 votes for “Yes”
Part II The Referendum
Legal Processes

- Upon the completion of Phase 1 work, the subject text of the proposed referendum along with the signature papers must be submitted to the Central Election Commission (CEC).

- The CEC would examine the validity of the signature papers and the legitimacy (to avoid ambiguity and misleading) of the subject text.

- Revisions on the submitted text may be required.

- Phase 2 work cannot be started until Phase 1 work is completed.
Part II The Referendum
Legal Processes

- After Phase 1 work is completed and approved, there will be a time period of three months for the advocates to collect endorsing signatures.

- Upon the completion of Phase 2 work, the signature papers must be submitted to the CEC again.

- The CEC would again examine the validity of the signature papers and announce the final valid number.

- An official announcement on the designated referendum, including the date of voting, will be made by the CEC when all requirements are fulfilled.
Part II The Referendum
Legal Processes

- It is then on to **Phase 3: the voting**, together with possible major local or central elections.
- In general, there will be at least one month for the advocates to collect donations and to advertise and promote the referendum in social media.
- The CEC in this period will hold 5 public TV broadcasts for the two sides to express their opinions on the referendum to the general public.
Part II The Referendum
Planning and Execution – Phase 1

On March 2\textsuperscript{nd} of 2018, Prof. Min Lee (middle), Mr. Shih-Hsiu Huang (left), and Mr. Yen-Peng Liao (right) stepped out to jointly led the referendum. An official website was set up to help promote the activity.
The subject text of the referendum is

“Do you agree that, in order to avoid air pollution and ecological catastrophe caused by the nuclear-free homeland policy, Paragraph 1 of Article 95 in the Electricity Act should be repealed, the nuclear free homeland policy should be terminated, and the nuclear power units should be restarted to ensure that the public may continue to have abundant and stable electricity supply and low electricity prices?”
Part II The Referendum
Planning and Execution – Phase 1

- **Signature collection for Phase 1 work started immediately.**
- **It was completed on March 27th of 2018.**
Part II The Referendum
Planning and Execution – Phase 1

- A press conference was held at 10 a.m. on March 29th of 2018.

- A total of 2,337 signature papers together with the subject text were submitted to the CEC at 11 a.m.
Part II The Referendum
Planning and Execution – Phase 1

We were notified by the CEC on April 17th that the subject text was not approved. A hearing was therefore required and arranged on May 8th.

On May 15th, we were told to revise the subject text. An official letter from the CEC arrived on May 24th, stating that the Phase 1 process would be approved after the subject was revised.
Part II The Referendum
Planning and Execution – Phase 1

The subject text was revised on June 6th, and was resubmitted to the CEC.

An official form from the CEC for collecting endorsing signatures was received at the end of June.

From

Do you agree that, in order to avoid air pollution and ecological catastrophe caused by the nuclear-free homeland policy, Paragraph 1 of Article 95 in the Electricity Act should be repealed, the nuclear free homeland policy should be terminated, and the nuclear power units should be restarted to ensure that the public may continue to have abundant and stable electricity supply and low electricity prices?

To

Do you agree to repeal Article 95 paragraph 1 of The Electricity Act: “The nuclear-energy-based power-generating facilities shall wholly stop running by 2025“?
Preparation work for Phase 2 started on June 27th.
Setting up an official FB page and a fan page
Raising funds & requesting donations
Making Signature forms ready for download
Setting up distribution locations for blank forms
Holding a kick-off meeting for key volunteers
Forming local volunteer teams around the country
Distributing promotional messages via the internet (FB, IG, …) and the chatting apps.
Collaborating with the candidates in the 9-in-1 local election
Part II The Referendum
Planning and Execution – Phase 2

Promotional Activities

Information sharing from people to more people
e.g. 1 to 10, 10 to 100, ... 1000 to 10,000

Lectures

Intense media exposures

Special activity of bananas eating

Close collaborations with celebrities

Street contacts

One-day gathering at rain and subway stations around Taiwan

Stationing of volunteers at major popular locations every day
Part II The Referendum
Planning and Execution – Phase 2

Promotional Activities
Part II The Referendum
Planning and Execution – Phase 2

Promotional Activities
Part II The Referendum
Planning and Execution – Phase 2

Promotional Activities

Promotional Activities

815大停電滿周年... 不缺電？ 頭條沒說的真相
Part II The Referendum
Planning and Execution – Phase 2

Promotional Activities
Part II The Referendum
Planning and Execution – Phase 2

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Promotional Activities
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Planning and Execution – Phase 2

Promotional Activities
Part II The Referendum
Planning and Execution – Phase 2

**Challenges**

*For the first 10 days, we received only 11,880 signature papers, and we need at least 281,745.*
Part II The Referendum
Planning and Execution – Phase 2

Challenges - Difficult to obtain an endorsed paper

Unofficial data analysis indicated that......

<table>
<thead>
<tr>
<th>Success rate on getting an endorsement</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Senior professors</td>
<td>10%</td>
</tr>
<tr>
<td>Master Students (Male)</td>
<td>20%</td>
</tr>
<tr>
<td>Kids</td>
<td>30-40%</td>
</tr>
<tr>
<td>Master Students (Female)</td>
<td>80%</td>
</tr>
<tr>
<td>Young Girls</td>
<td>100%</td>
</tr>
</tbody>
</table>

A signature paper would contain private personal information, so it is very important to be trusted by passersby.
Part II The Referendum
Planning and Execution – Phase 2

Challenges

Many mistakes were found on the signature papers, and these papers must be discarded.
Part II The Referendum
Planning and Execution – Phase 2

Sorting the Papers - The nightmare of the volunteers

The papers were very difficult to open!
The ones that were completely glued or sealed with special tapes were even harder to open.
Some were even glued and sealed with tapes. It was extremely frustrating when one found the paper was totally blank inside!

Statistics:
One could open 4-6 papers in 1 minute.
Glued papers: 2 minutes or more
Glued and tape-sealed ones: >5 minutes
Part II The Referendum
Planning and Execution – Phase 2

*Sorting the Papers - Anyone can be a volunteer*
Part II The Referendum
Planning and Execution – Phase 2

Sorting the Papers - Counting everyday
Part II The Referendum
Planning and Execution – Phase 2

Sorting the Papers - Clean & organized, but not enough
Part II The Referendum
Planning and Execution – Phase 2

- Sorting the Papers - Papers pouring in
Part II The Referendum
Planning and Execution – Phase 2

- *Sorting the Papers* - *New boxes ready for loading*
Part II The Referendum
Planning and Execution – Phase 2

Sorting the Papers - Power up and pay happily

Paying for the cost of pre-paid signature papers at the post office
Part II The Referendum
Planning and Execution – Phase 2

Sorting the Papers

When the tentative deadline of September 6th for submitting the papers to CEC was approaching, we did not have too many photos.

Everyone had been burning the candle at both ends!

Collecting signature papers from all over Taiwan

Sorting papers by counties and districts, and making them into booklets

Duplicating all signature papers by copying

Counting, packaging, and boxing
Part II The Referendum
Planning and Execution – Phase 2

Sorting the Papers - It was the time (late night of Sep. 5\textsuperscript{th}) for a group photo as the target was reached.
Part II The Referendum
Planning and Execution – Phase 2

Shipping to CEC
Part II The Referendum
Planning and Execution – Phase 2

Shipping to CEC - followed by a press conference
Part II The Referendum
Planning and Execution – Phase 2

- **Inventory at CEC - 314,135 (>281,745) papers in total**
Part II The Referendum
Planning and Execution – Phase 2

- Second submission to CEC and the hunger strike

We continued to receive lots of papers after the last submission. More sorting and packaging were conducted. To ensure there would be sufficient papers after the validity check, we prepared for a second submission. More than 24000 signature papers were delivered to the CEC on September 13th, one day before the official deadline.

The CEC refused our second submittal. One of the referendum leaders, Mr. Shih-Hsiu Huang, decided to immediately go on a hunger strike on site. In the meantime, a law suit against the CEC was filed.
Part II The Referendum
Planning and Execution – Phase 2

- Second submission to CEC and the hunger strike
Part II The Referendum
Planning and Execution – Phase 2

We eventually won the law suit, and the referendum was approved by the CEC on October 23\textsuperscript{rd}, with more than 290,000 valid signature papers.

We were ready to move on to Phase 3, and we have only 1 month to promote the referendum on November 24\textsuperscript{th}.
Part II The Referendum
Victory of “Go Green with Nuclear” – Phase 3

- The “Go Green with Nuclear” referendum was designated as #16 by the CEC.
- There were 5 CEC public TV broadcasts.
- Promotional Activities
  - Spreading information on Referendum #16
  - More lectures
  - Continued street contacts
  - Intense media exposures
  - Live broadcasting of “Energy Talks” shows
  - Continued close collaborations with celebrities
  - Stationing of volunteers at major popular locations every day
Part II The Referendum
Victory of “Go Green with Nuclear” – Phase 3

- CEC public TV broadcasts
Part II The Referendum
Victory of “Go Green with Nuclear” – Phase 3

Promotional Activities - Spreading
Part II The Referendum
Victory of “Go Green with Nuclear” – Phase 3

Promotional Activities - Video Clips
Part II The Referendum
Victory of “Go Green with Nuclear” – Phase 3

Promotional Activities - Spreading
Part II The Referendum
Victory of “Go Green with Nuclear” – Phase 3

Promotional Activities

Energy Talks
Part II The Referendum
Victory of “Go Green with Nuclear” – Phase 3

Promotional Activities - Street contacts
Part II The Referendum
Victory of “Go Green with Nuclear” – Phase 3

Fighting with dirty tricks one day before the voting
Part II The Referendum  
Victory of “Go Green with Nuclear” – Phase 3

- **We needed 4,939,267 “Yes” votes.**

- **We won the referendum on November 24th of 2018!**

- **In particular, the assent votes were all greater than the dissent votes at districts with nuclear power plants.**
Part II The Referendum
Victory of “Go Green with Nuclear” – Phase 3

Reactions from the government
Part II The Referendum
Victory of “Go Green with Nuclear” – Phase 3

My reaction - Do not dare to stick with nuclear free homeland!
Final Remarks

- For all NPPs, no decision will be made until late January this year. A full-scope evaluation will be conducted to help determine to what extent the current energy policy needs to be revised after the referendum.

- The 1st, 2nd, and 3rd, and the mothballed 4th nuclear power plants should go for life extension and be restarted, respectively.

- The government should stop the delivery of the unused fuel assemblies from the 4th Nuclear Plant to the U.S.

- We continue to write editorial articles in major news media to put necessary pressure on the government.
Into the Future

- Put more efforts in general education to the public on nuclear safety, nuclear wastes disposal, and correct radiation knowledge.
- Continue to promote the concept of “going green with nuclear”.
- Strengthen international communications and information exchanges on general issues of nuclear energy.

Thank you all for listening and for the invitation!