

A photograph of a sunset over the ocean. The sun is a bright orange circle on the horizon, with its light reflecting on the water. The sky is a gradient of orange and yellow. The foreground shows dark, choppy waves.

風力發電場：香港不宜

Wind farm : Not for Hong Kong

吳振揚 (Young Ng)
25-6-2011 香港大會堂 (City Hall)

與風電場有何關係?

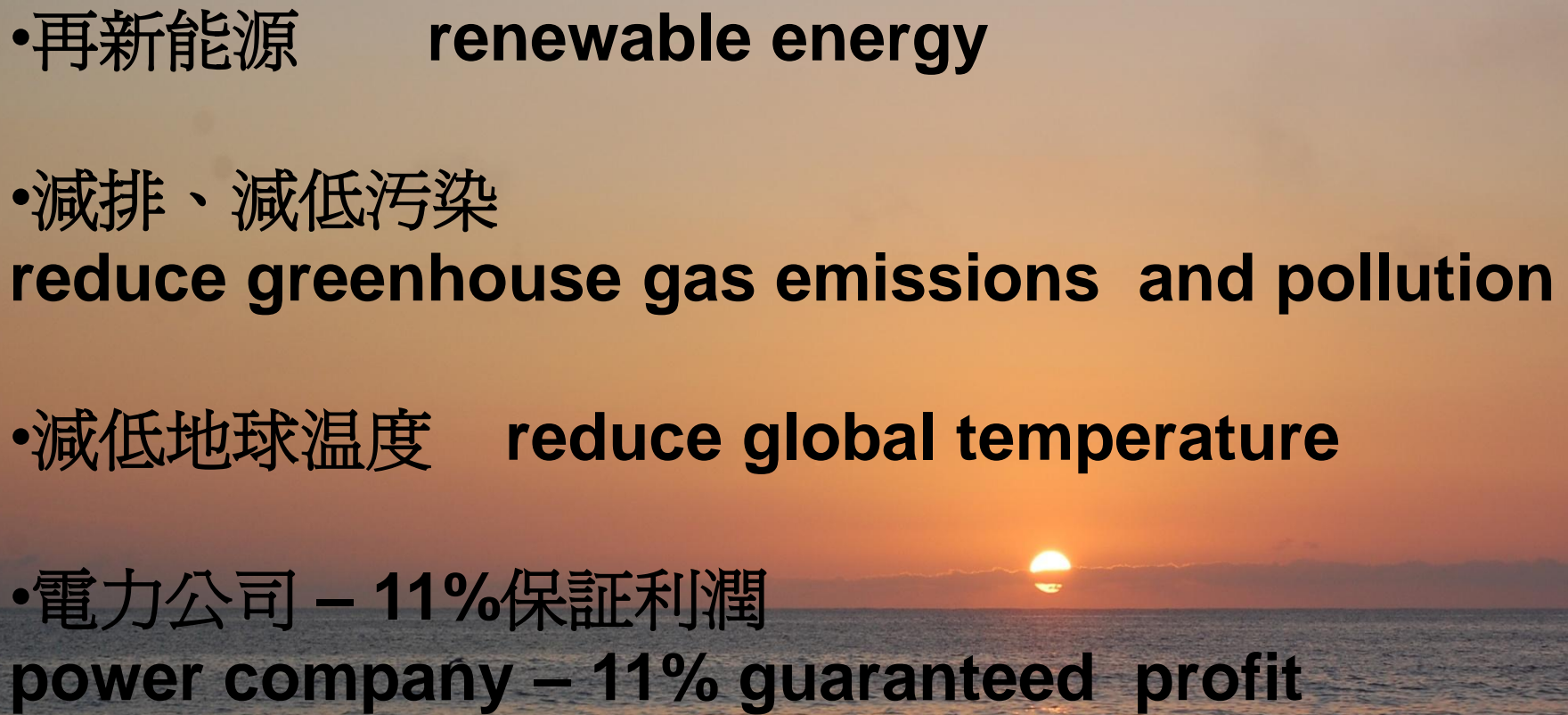
Relationship with wind farm?

- 興建風電場的目的
- Purpose of constructing wind farm
- 西貢東南海上風電場計劃
- Sai Kung Southeast offshore wind farm project
- 公眾有權知到的事實
- Public's right to know the facts

氣候變化 + 全球暖化

Climate Change + Global Warming



- 
- A background image of a sunset over the ocean. The sun is a bright orange circle on the horizon, with its light reflecting on the water. The sky is a gradient of orange and yellow, and the water is dark blue with white-capped waves in the foreground.
- 再新能源 **renewable energy**
 - 減排、減低污染
reduce greenhouse gas emissions and pollution
 - 減低地球溫度 **reduce global temperature**
 - 電力公司 – 11%保證利潤
power company – 11% guaranteed profit

興建風電場的目的

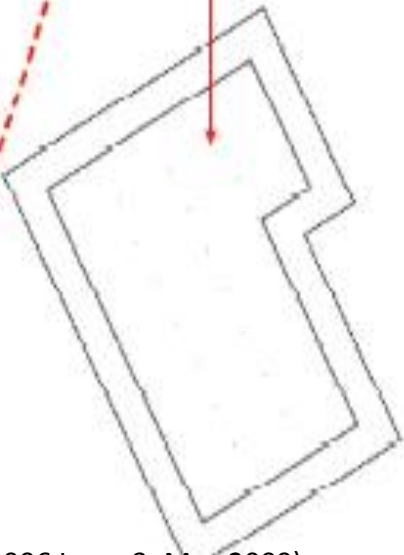
Purpose of constructing wind farm



**proposed wind
farm territories
風電場選址**

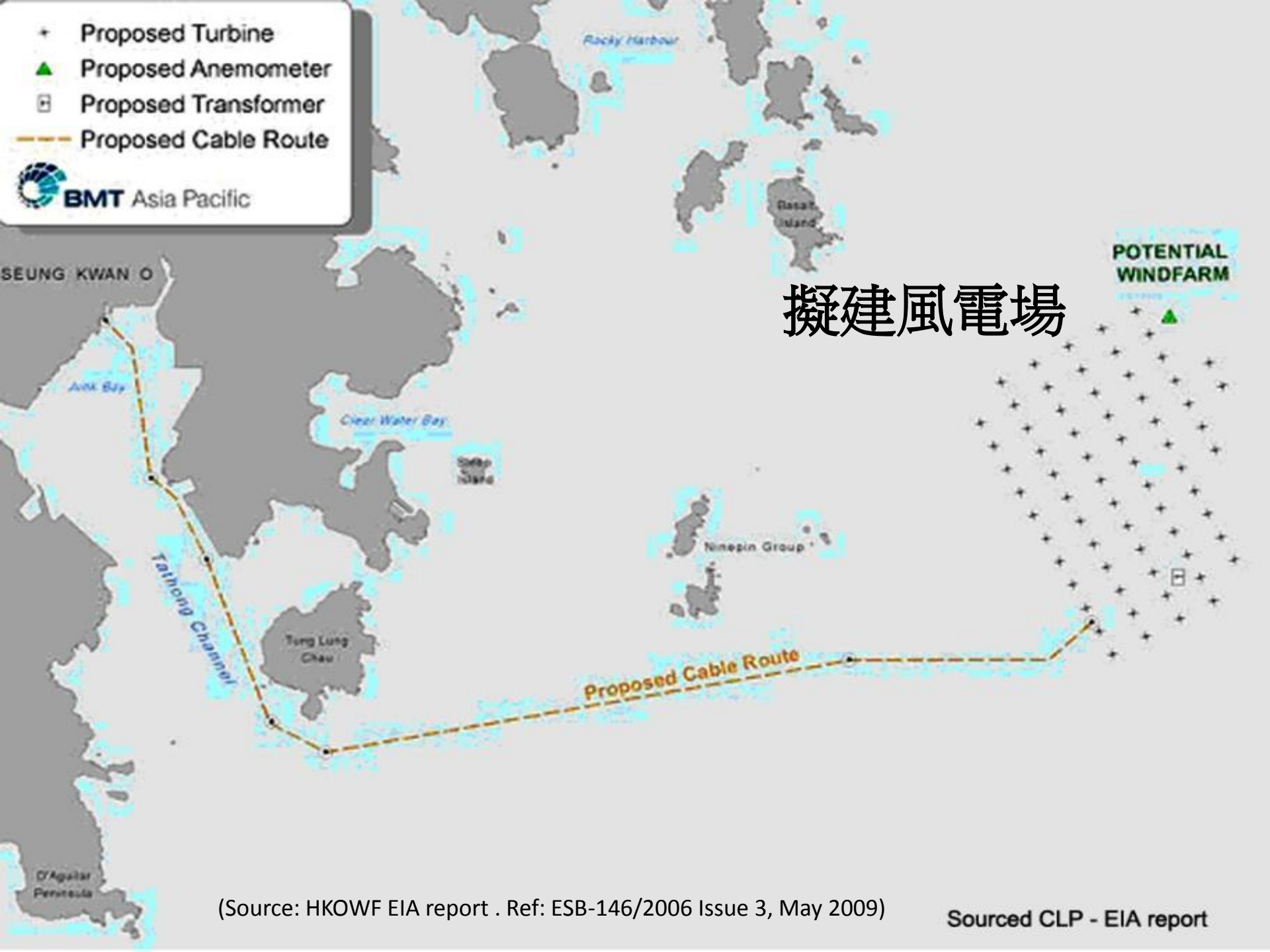
**Geopark
地質公園**

APPROX LOCATION OF
PROJECT SITE



(Source: HKOWF EIA report . Ref: ESB-146/2006 Issue 3, May 2009)

- + Proposed Turbine
- ▲ Proposed Anemometer
- ☐ Proposed Transformer
- Proposed Cable Route



擬建風電場

(Source: HKOWF EIA report . Ref: ESB-146/2006 Issue 3, May 2009)

香港東南海上風電場計劃

HK offshore wind farm in southeastern water

- 所佔面積 : 15平方公哩 (HK 總面積連海: 1%)
- **Total wind farm area: 15 sq.km (1% of HK total area including sea)**
- **風車 No. of turbines:**
67(3MW each)/40(5MW each)
- **每枝距離 Distance apart:**
450m/630m
- **高度 Height: 125 - 150 m ASL**
- **每枝直徑 : 8 m**
- **Diameter of mast : 8 m**



(Source: HKOWF EIA report . Ref: ESB-146/2006 Issue 3, May 2009)

香港東南海上風電場計劃

HK offshore wind farm in southeastern waters

• 平台 Platform : 15m ASL

• 離東果 / 火石洲 4 - 5公哩

Distance from : E. Ninepin
/ Basalt Island 4-5km

• 生產 < 1% 全港用電量

Capacity to produce: <1% of
total HKSAR annual electricity
needs

• 成本 > 100億

Cost : > HKD10 billion

• 更換年期 Life span : 20年 / yrs



• 成本效益? 電費需加少? Cost efficiency? Increase electricity bill by how much?

• 可持續嗎? Sustainable?

• 減排效果? 改善空氣質素?

• Effectiveness to reduce greenhouse gas emission?

Improvement of air quality ?

• 再生能源目標是否實際?

• Is renewable energy target practicable?

公眾有權知到的事實

The public has the right to know the facts

- 
- 世界級自然遺產, 香港最後、最自然的一角?
World class natural heritage? Hong Kong's last and most natural corner?
 - 自然生態環境保育? Conservation of natural ecological environment
 - 自然景觀影響? Effect on natural aesthetic value
 - 嘈音、光害問題? Noise and light pollution

公眾有權知到的事實

The public has the right to know the facts

•促進旅遊? Enhance tourism?

•航運安全? seaway safety ?

•是否有其它既不破壞環境又更有經濟效益的好方法?

Any other better alternatives which do not destroy our natural environment and are more economical?

公眾有權知到的事實

The public has the right to know the facts

歸納 3 方面來分析

Analysis in three aspects

- 基本科學論據 Fundamental scientific arguments
- 成效 Effectiveness
- 環境影響 Environmental impact

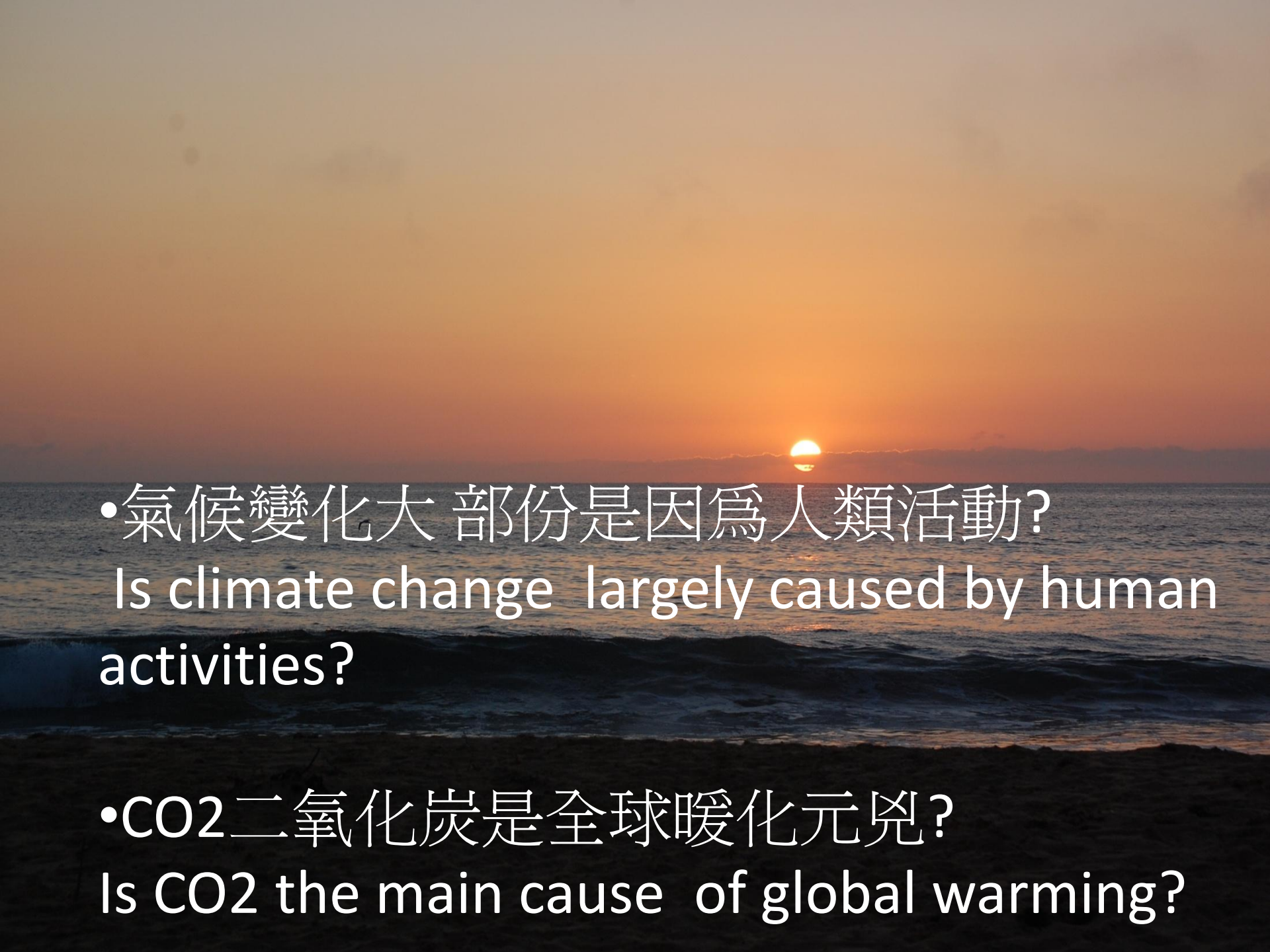
解答以上問題

To answer captioned questions



基本科學論據

Fundamental scientific arguments

A sunset over the ocean with the sun low on the horizon, casting a warm orange glow across the sky and reflecting on the water. The waves are visible in the foreground.

•氣候變化大部份是因爲人類活動?

Is climate change largely caused by human activities?

•CO₂二氧化碳是全球暖化元兇?

Is CO₂ the main cause of global warming?





Peculiar shapes

奇形怪狀

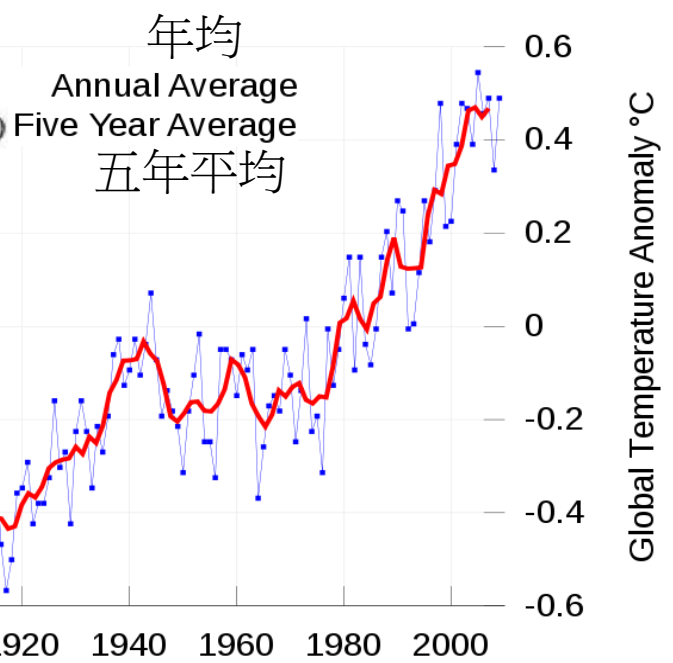
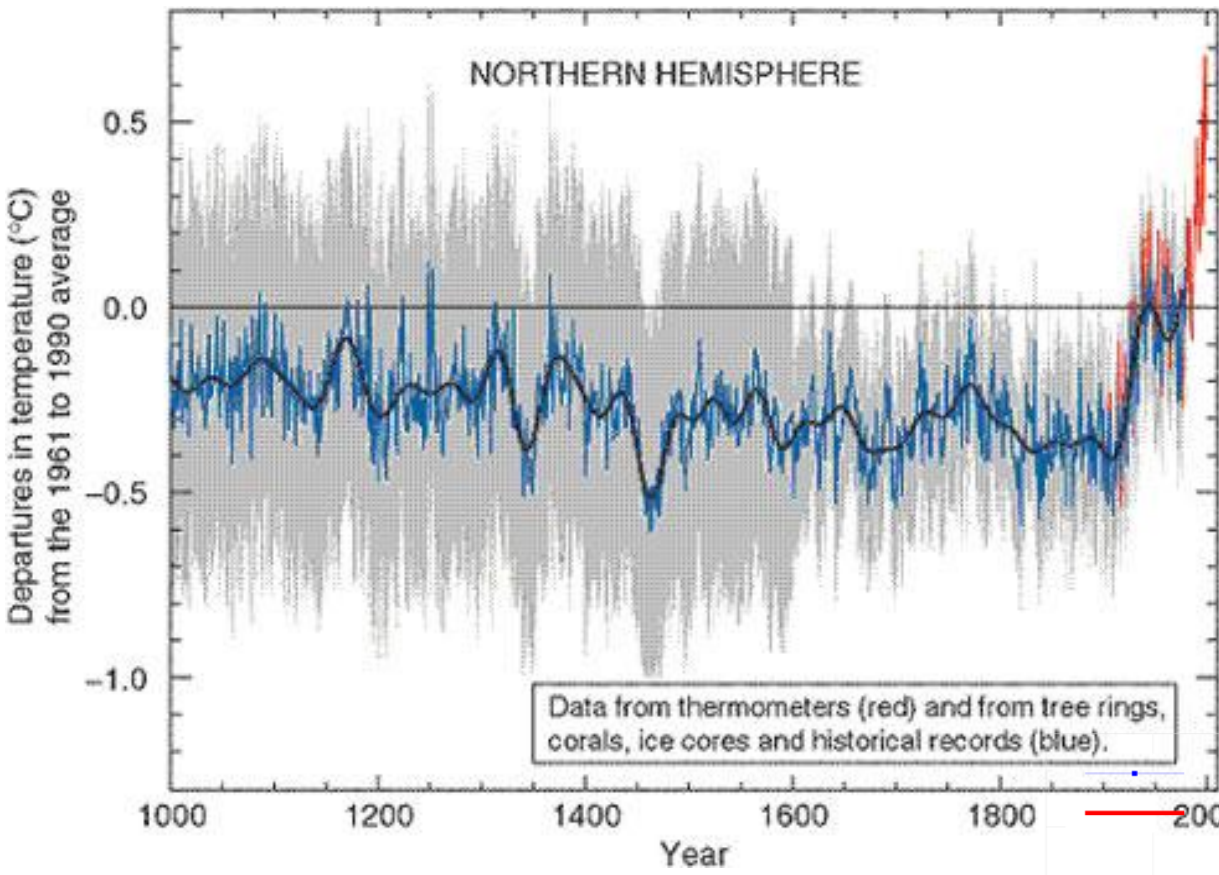


Sandstone砂岩層

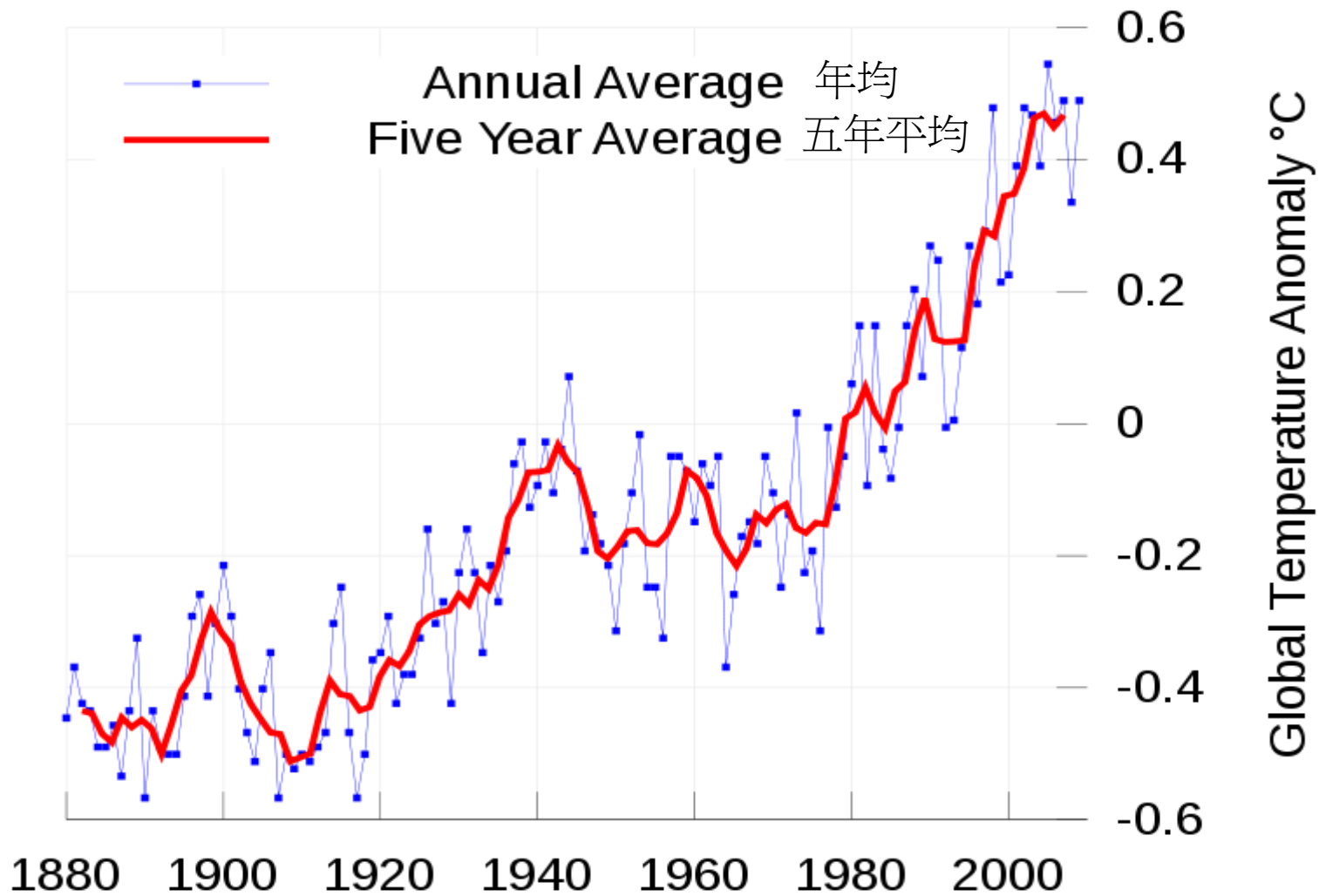
Conglomerate礫岩層

Sand and siltstone
砂岩及粉砂岩層

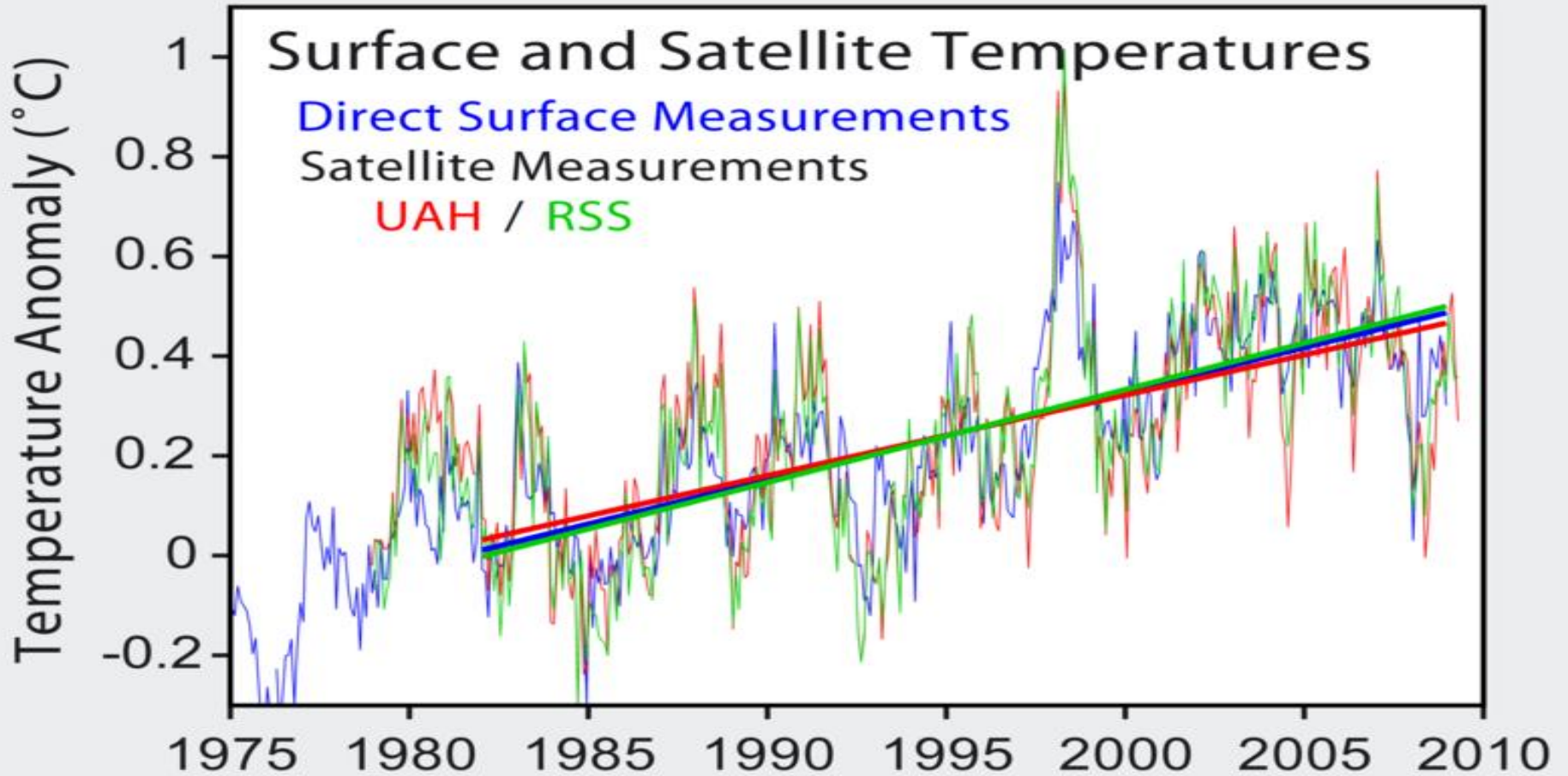
Conglomerate礫岩層



曲棍球圖表
Hockey Stick graph

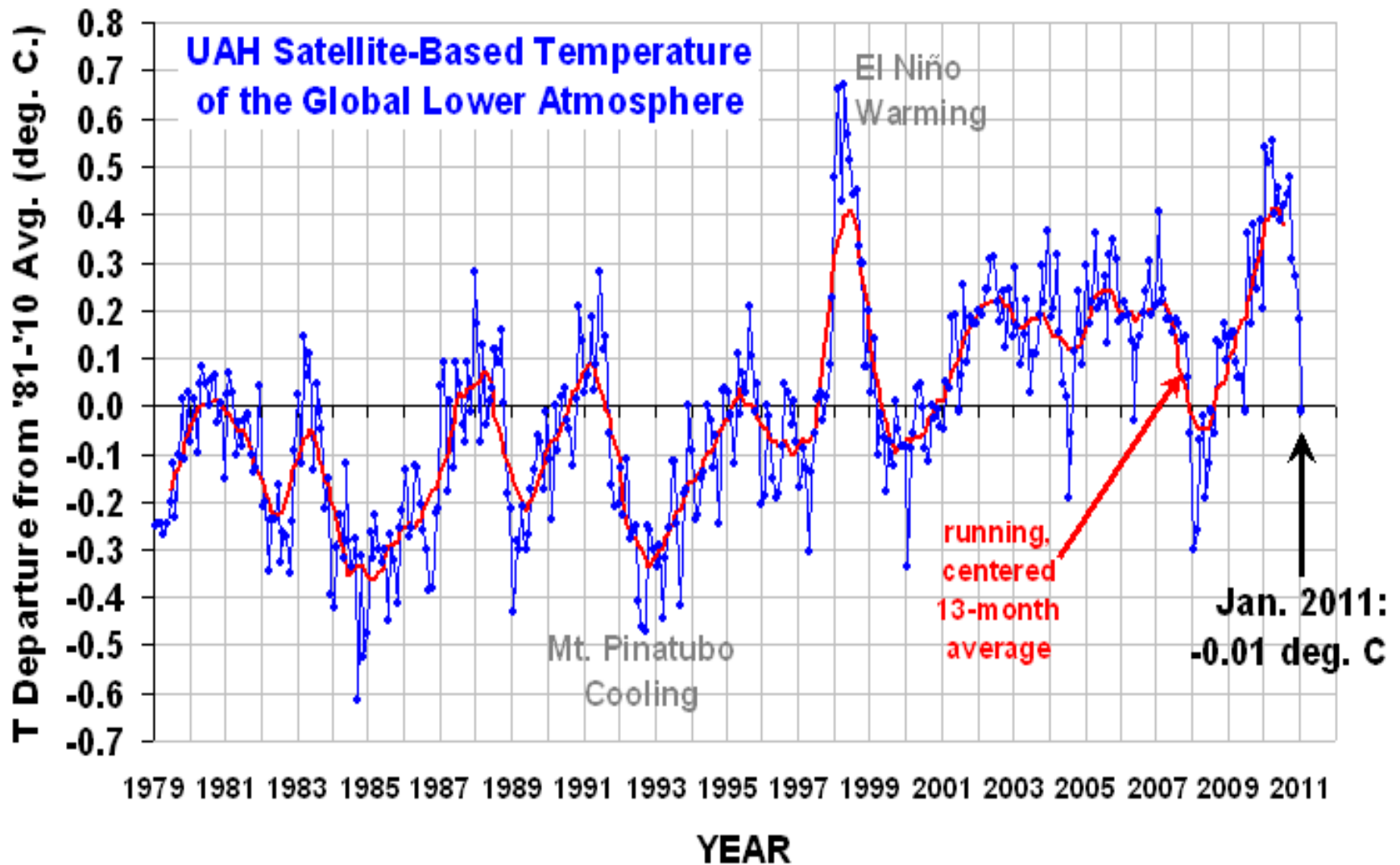


Source: NASA's Goddard Institute for Space Studies (2006)



Source: Spencer 2010

<http://www.droyspencer.com/latest-global-temperature/>



Note: 11 Advanced Microwave Sounding Unit (AMSU-A) : instruments flying on 11 different satellites, measuring the natural microwave thermal emission from oxygen in the atmosphere.
 Source: Spencer 2010 <http://www.droyspencer.com/latest-global-temperature/>

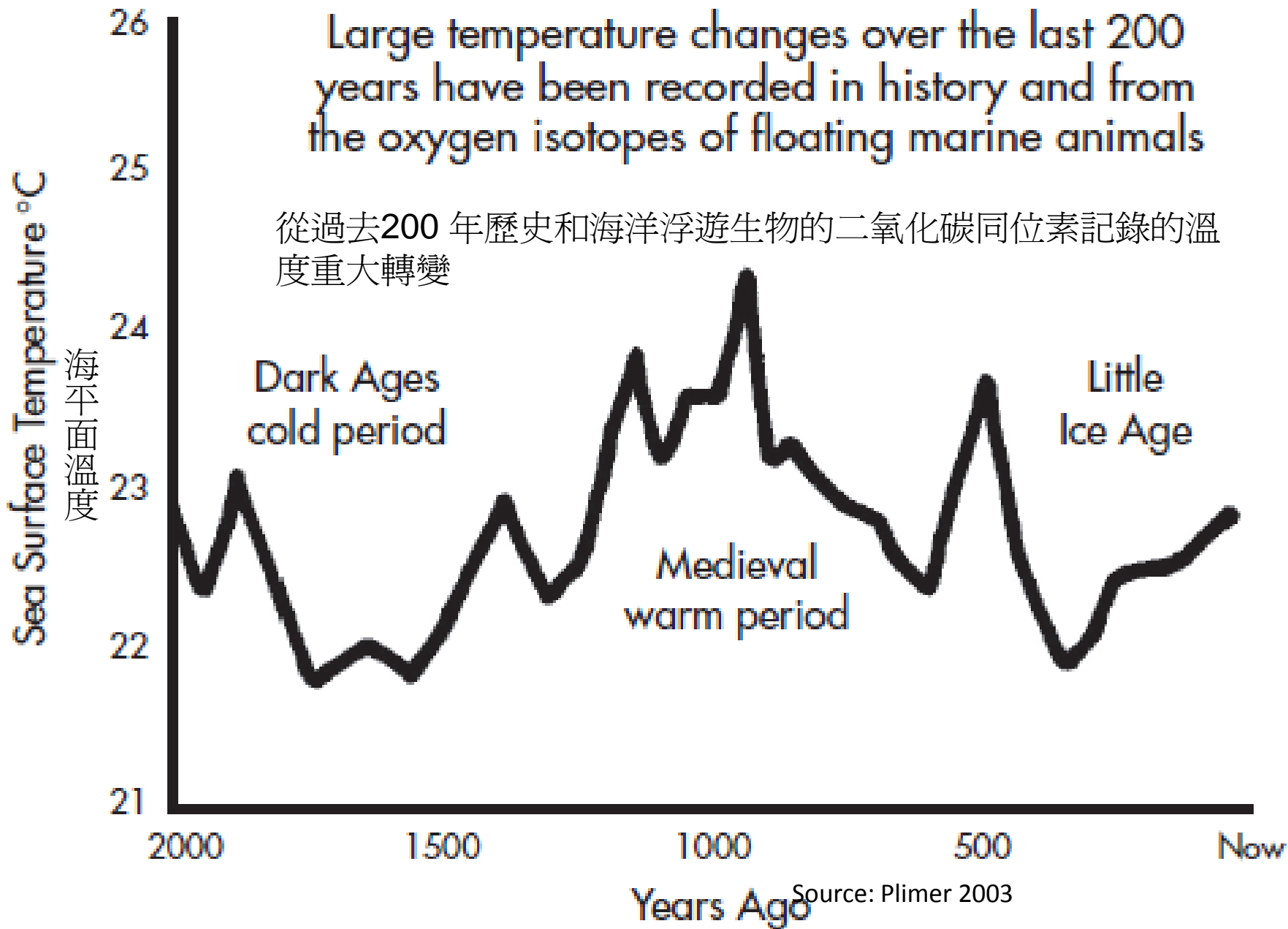
歷史紀錄 3段溫度異常時期

Historical record of three extreme temperature era

- 900-1300 AD 中世紀和暖期 Medieval Warming
- 1500-1850 小冰河時期 Little Ice Age
- 100 年前至今 工業革命和暖期 Industrial Era

Large temperature changes over the last 200 years have been recorded in history and from the oxygen isotopes of floating marine animals

從過去200年歷史和海洋浮遊生物的二氧化碳同位素記錄的溫度重大轉變



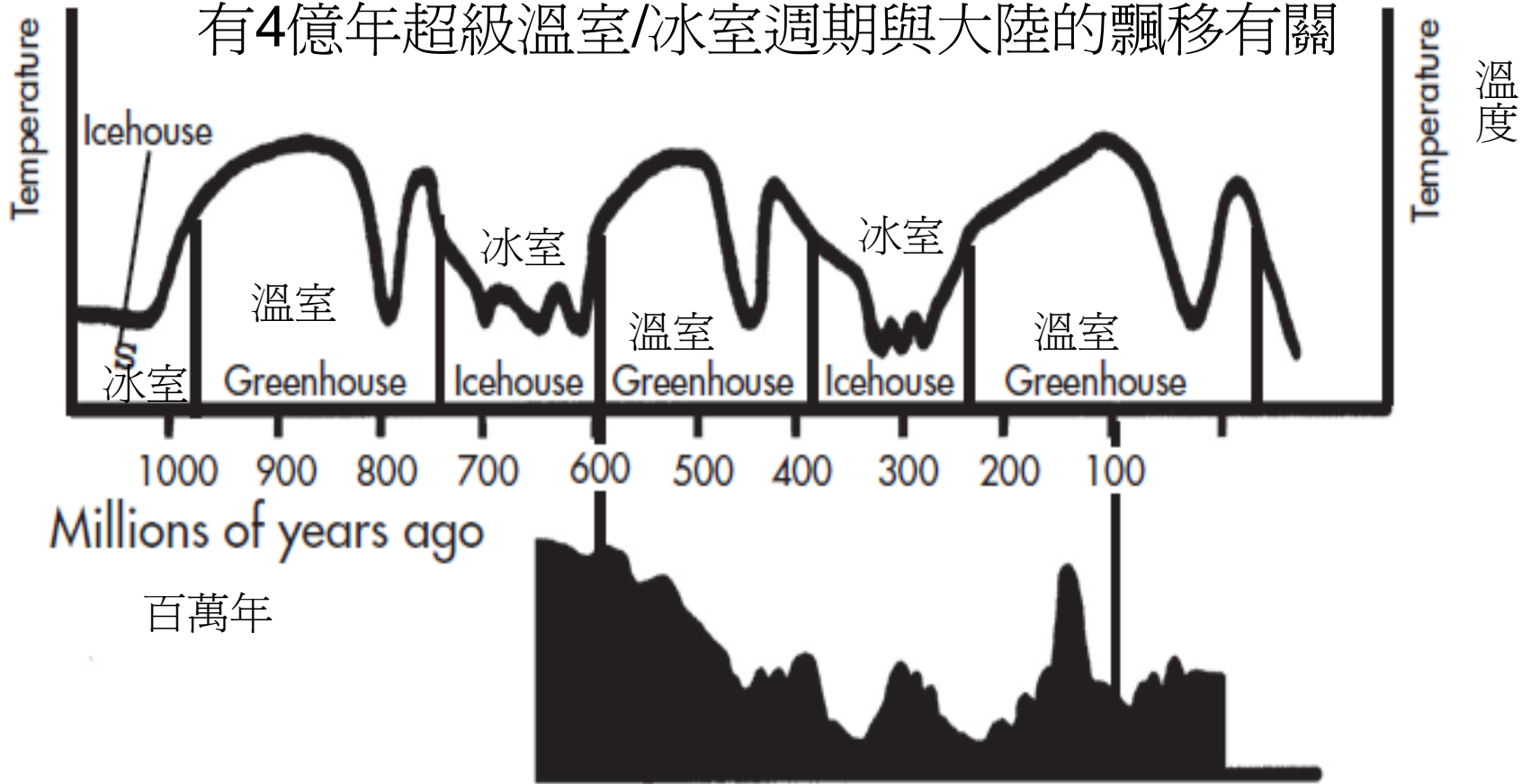
一個被遺忘的重要理論

A forgotten important theory

- Uniformitarianism (均變理論)
- The Present is the Key to the Past
(當今問題乃過去問題的線索),
James Hutton 1785
- The Past is the key to the present
(過去問題乃當今問題的線索),
Charles Lyell's Principles of Geology 1830
- The past & present are the keys to future
(過去及當今問題乃將來問題的線索)

There are 400 million year supercycles of greenhouse/
icehouse related to the pulling apart and
stitching together of continents

有4億年超級溫室/冰室週期與大陸的飄移有關

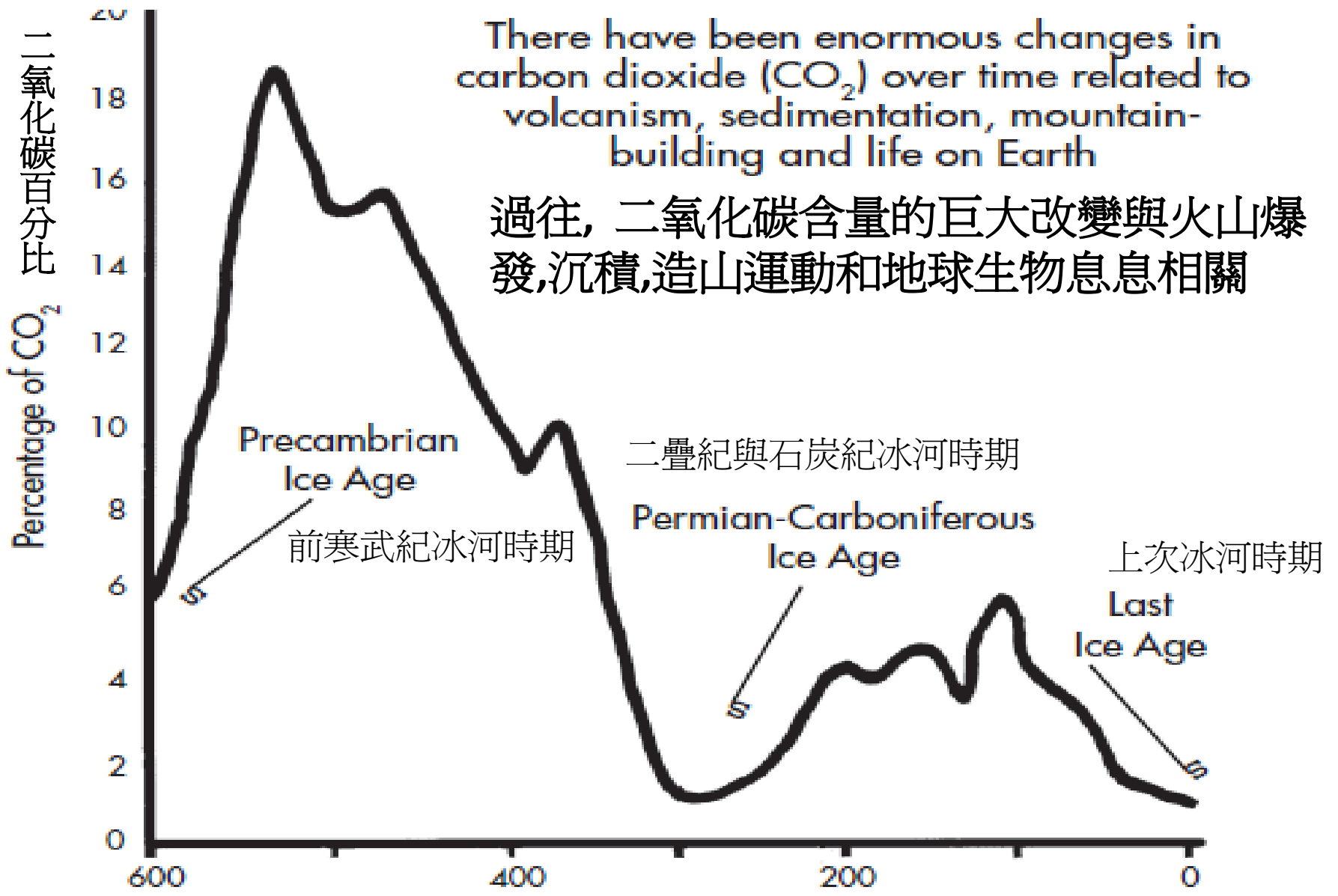


Source: Plimer 2003

| Warm/Cold periods | Years before present (bp) |
|----------------------|---------------------------|
| Pleistocene Ice Age | 110,000 - 14,700 bp |
| Bolling | 14,700 - 13,900 bp |
| Older Dryas | 13,900 – 13,600 bp |
| Allerod | 13,600 – 12,900 bp |
| Younger Dryas | 12,900 – 11,600 bp |
| Holocene Warming (a) | 11,600 – 8,500 bp |
| Egyptian Cooling | 8,500 - 8000 bp |
| Holocene Warming (b) | 8,000 - 5,600 bp |
| Akkadian Cooling | 5,600 – 3,500 bp |
| Minoan Warming | 3,500 – 3,200 bp |
| Bronze Age Cooling | 3,200 – 2,500 bp |
| Roman Warming | 500BC -535 AD |
| Dark Ages | 535AD- 900 AD |
| Medieval Warming | 900AD – 1300AD |
| Little Ice Age | 1300AD – 1850AD |
| Modern Warming | 1850AD - |

近代地球歷史的冷暖週期

**The cooling
warming cycles of
modern earth
history**



Source: Plimer 2003

IPCC醜聞 IPCC Scandals (2007-09)

Intergovernmental Panel on Climate Change

政府間氣候變化專門委員會

- 曲棍球門 (**Hockey Stick**) - 內部電郵被盜 (internal email being hacked)
- 氣候門 (**Climate Gate**)- IPCC 灰色文獻 (controversial documents about IPCC's conspiracy to falsify temperature data and destroy information)
- 冰川門 (**Glacier Gate**)- IPCC 灰色文獻 (controversial documents)
- 亞馬遜門 (**Amazon Gate**)- IPCC 灰色文獻 (controversial documents)

IPCC醜聞 Scandals (2007-09)

大堡礁門 (Great Barrier Gate)

➤事件揭露了一些“科学家”操縱有關數據的幕後背景，令人感到震驚

➤These scandals revealed the background information of some scientists manipulated the related data which is extremely alarming

• 人類未存在之前，地球已經有冷 暖週期

The earth has cooling and warming cycle long before human being 's existence

• 人類未存在之前，地球上CO2 含量已經有高有低，與火山爆發 關係緊密

Before the existence of human being, the earth's CO2 content has been up and down which is closely related to volcanic activities

• 球氣候變化是正常，不變才是不正常

Global climate change: CHANGE is normal while UNCHANGE is abnormal



成效

Effectiveness

Exaggeration 言過其實

| Station/Capacity | Sun Law/16MW | North Hoyle offshore/60MW | Cefn Croes/58.5MW |
|---------------------------|---|---|--|
| Developer 發展商 | Renewable Energy System (RES) | National Wind Power (now npower) | GE Energy RDC Falck Renewables |
| Claim 聲稱 | “Will support 14,000 homes”. (would need a 47% load factor) 供電給1萬4仟個住宅 | “... meet the demand of 50,000 homes.” (would need a 45% load factor) 可應付5萬個住宅需求 | “...serve about 40,000 households.” (would need a 37% load factor) 供電給4萬個住宅 |
| Actual 事實 | 5 year’s average actual yield 39,433 MWh/y (26% load factor) gives 7704 homes 實際供電給7,704 個住宅 | 4 years average 34% load factor gives 37,778 homes) 實際供電給37,778 個住宅 | Highest load factor 31% & lowest 25%. 27,000 homes 實際供電給27,000 個住宅 |
| Exaggeration 跨大 | X 1.8 | X 1.3 | 1.2 – 1.5 |
| Source 資料來源 | “Powering tomorrow’s world” RES (2005) | National Wind Power 2003 website publicity | GE Energy RDC Falck Renewable release |

•Actual yield and Load factors from CLOWD ROC Register analysis by A. Tubb.

•Number of homes calculated from BWEA’s 4,700KW/y/home (source: Etherington 2009. p157)

Extreme exaggeration 極度跨大

- In late 1990's **Wind Prospect** commissioned Askam Wind Cluster, Old Park Farm, Cumbria
- Developer claimed: expected output 18GW/h/y by its 4.62 MW of installed capacity . It required a load factor 44% 發展商聲稱一4.62 MW 風車生產量預估為18GW/h/y, 容量因素為44%.
- Actual: 2002-2007 – average load factor of Old Park Farm was 24.8% 2002-07實際平均容量因素為24.8%
- Exaggerated by 80% 極度跨大了80%

供電不穩定

Unstable Electricity Supply

- 無風 no wind 、 不夠風 insufficient wind
- 太大風 too windy 、 太冷 too cold



A background image of a sunset over the ocean. The sun is low on the horizon, casting a warm orange glow across the sky and reflecting on the water. The waves are visible in the foreground, appearing dark against the lighter sky.

- 必需有後備電力供應

Must have power supply backup

- 興建、維修成本高, 納稅人、用戶必需大力資助 **High construction and maintenance cost which are immensely subsidized by consumer and tax payer**

- 使用20年

Only 20 years life span







• 環境影響

Environmental impact

Heights of famous HK buildings

香港著名建築物高度與西貢風車比較

| Building | Height | Compare with SK wind turbine |
|-------------------|--------------------|------------------------------|
| SK Wind Turbine | 138m | N/A |
| ICC | 484m (118 storeys) | 3.5 times |
| IFC Two | 415m (88 storeys) | 3.0 times |
| Central Plaza | 374m (78 storeys) | 2.7 times |
| Bank of China | 367m (70 storeys) | 2.7 times |
| City Hall Central | 50m (10 storeys) | 1/3 (same length as blade) |
| TST Clock Tower | 45m | 1/3 (same length as blade) |

SK wind turbines...

- Each of them is a gigantic concrete and steel structure
- 每一枝都是用鋼筋水泥造成的龐然大物
- Imagine 67 huge steel structures in a group being erected in the beautiful sea of Sai Kung. What will they look like?? 試想67枝龐然大物豎立在西貢海面



風車葉長度 turbine length =
50m 中環大會堂 (City Hall),
舊中國銀行總行 (Bank of
China former head quarter)

風車高度 height of turbine
= 2座 舊中國銀行總行
2 blocks of old Bank of
China Head Quarter (76m x 2)

= 3座中環大會堂 (50m x 3)
3 blocks of City Hall

= 3座尖沙咀鐘樓 (45m x3)
3 blocks of Tsimshatsui
Tower





COLLETT

HEAVY TRANSPORT

MAN STGO
CAT 3

YJ56 KLP



Globetrotter

MDF transport
GT. YARMOUTH
+44(0)1493-441444

















A satellite map of the Sai Kung Super Caldera in Hong Kong. A large red circle highlights the entire caldera area. Inside this, a yellow circle highlights the 'Core Area'. Within the yellow circle, a blue rectangle indicates the location of a 'Wind Farm'.

Sai Kung Super Caldera
西貢超級破火山口

Core Area
中心區

Wind Farm
風電場

- ✓ 破壞地質遺址完整性
- ✓ destroy the uniqueness and completeness of the geological heritage

- ✓ 破壞香港最後一個100%自然的花園
- ✓ destroy the last 100% natural garden

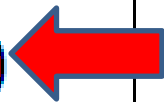
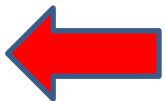
生態 Ecology

- 光害、噪音 Light and noise pollution
- 飛鳥、魚類 birds and fish



中電2010年度業積

China Light & Power 2010 Financial Highlights (in 100 million)

| 至 2010 年 12 月底止 | 億元 (HK\$) | 增減 (%) |
|--|--|---|
| 營業額 turnover | 584.10 | +15.3 |
| 香港業務盈利 HK business profit | 70.12 | +3.3 |
| 海外盈利 Overseas business profit | 24.76 | +19.0 |
| 非經常盈利 Extraordinary gain/loss | 11.84 | 09 年虧損 3.4 億元 |
| 股東盈利 Profit attributable to shareholders | 103.30  | +26.2  |

(資料來源: 星島日報 24.2.2011)

Source: Sing Tao Daily 24.2.2011

按業務劃分盈利

| 項目 | 億元 (HK\$) | 增減 (%) |
|----------|-----------|--------|
| 香港管制計劃盈利 | 61.29 ← | +2.7 ← |
| 核電及抽水蓄能 | 8.36 | +11.8 |
| 售電內地盈利 | 0.47 | -36.5 |
| 澳洲營運盈利 | 13.03 | +77.0 |
| 內地電廠 | 6.42 | +73.0 |
| 印度 | 1.41 | -68.4 |
| 東南亞及台灣 | 3.9 | -25.7 |
| 澳洲稅項收益 | 9.89 | 不適用 |
| 售中電安順電廠 | 3.56 | 不適用 |

(資料來源: 星島日報 24.2.2011)



我們可做些什麼?
What can we do?



密切監察

Close Monitor

其它更有效更環保方法?

Other more effective environmental method?

- 公衆教育

- public education

- 節能生活方式

- energy saving living habit

- 節能工商業操作方式

- energy saving industrial and commercial operation method

- 循環再用

- Recycling

A sunset over the ocean with a bright sun low on the horizon, casting a golden glow across the sky and water. The waves are visible in the foreground.

- 節能技術

- energy saving technology

- 法例提升、嚴勵執行

- improve legislation and effective execution

- 提高火力發電效率

- increase fuel electricity generation efficiency




結論

Conclusion

1. 今天的氣候變化是否前所未有 ???
Is today's climate change unprecedented???
2. 全球暖化是否已達危險程度??
Has global warming reached a dangerous level???
3. 20世紀地球溫度變化是否異於以往正常差異?
Is the 20th century global temperature changes exceptional to the normal variance?

三個值得思考的問題

Three important worth considering questions

A background image of a sunset over the ocean. The sun is low on the horizon, creating a warm orange and yellow glow in the sky. The water in the foreground is dark with some white foam from waves.

•地球氣候是一個非常複雜的系統，減**CO2**排放就可防止氣候轉變及全球回暖是不可能的

•Climate is an extremely complicated system, it is impossible to prevent climate change and global warming simply by reducing CO2 emission

•氣溫上升**CO2**不一定是氣溫上升的主因

CO2 may not be the primary cause of increase in global temperature

•跟據地質歷史，氣候轉變是地球的自然現象

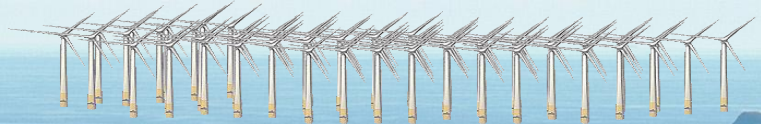
•Geological history indicates climate change is a natural phenomenon of the earth

- 
- 不惜代價包括破壞環境去減排極為不智
 - To reduce greenhouse gas emission regardless of whatever cost including destruction of our natural environment is unwise

 - 風是免費、但風電是非常昂貴的
 - Wind is free but wind power is extremely expensive

 - 風電技術未完善，產量低，暫未適合使用
 - Current imperfect wind power technology results in low efficiency , so currently not a feasible option

 - 不可容許以綠色環保之名圖大利，作大規模破壞環境工程建設
 - It is totally unacceptable to destroy our nature by large scale profitable construction project but disguised as environmental



完.....多謝!!
End.....Thank you