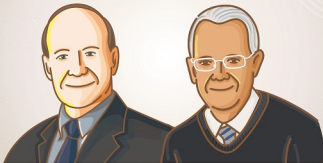


2018  
—Tang Prize—  
Sustainable Development



★★ James E. Hansen ★★      ★★ Veerabhadran Ramanathan ★★

James E. Hansen

# Why him?

01. Quantified the danger of global warming through **collecting and analyzing the data** of climate system's global temperature response.
02. Elucidated the physics of climate forcings and feedbacks towards the changes of global temperature.
03. Communicated the threat of global warming to the public and advocated effective governmental actions to reduce the risks.



James E. Hansen

## Human activities **accelerated** Global Warming



- 1 Participated in the development of GISS Model, one of the first two global three-dimensional climate models in the world.



- 2 The first to compile and analyze temperature records from around the world, leading to the recognition that the changes in global temperature has exceeded the scope of natural changes.



- 3 Testified in US Congressional Hearing in 1988 that "Global Warming is Here!", and indicated that "human activity" has been the major cause of global warming.





James E. Hansen

# He told us the consequences of global warming!



If the CO<sub>2</sub> emissions from burning the fossil fuel cannot be completely stopped between 2025 to 2030, the following catastrophes may happen:



Most Glaciers will melt within 50 years, and many coastal cities will be inundated due to sea level rising, turning hundreds of millions of people into "climate refugees".



The occurrence frequency of intense storms and extreme weather events such as tornado, flood, and drought, etc will increase.



Biological diversity will disappear, and large number of species will become extinct.



# Why him?

01. Has developed the fundamental understanding of climate change for general publics.
02. His groundbreaking researches on the impacts of **climate system** affected by **air pollution** and greenhouse gas emission has tremendous contributions.
03. Facilitated the policies for the mitigation of global warming and air pollution.



## Encourage **whole world** to take action



- 1** The first to discover the greenhouse effect of chlorofluorocarbons (CFCs), and advocate the restriction of CFCs emission through **Montreal Protocol**.
- 2** Identifying the atmospheric black carbon, methane, tropospheric ozone, and CFCs as greenhouse gases, and the impacts of these non-CO<sub>2</sub> greenhouse gas emissions on global warming are as serious as CO<sub>2</sub> emission.
- 3** Facilitated the initiation of "**Climate and Clean Air Coalition to Reduce Short-lived Climate Pollutants**", of which the members currently include **33 countries**.
- 4** Leads the "**Project Surya**" to improve the health of people and reduce the climate-warming impacts by utilizing the clean energy for cooking to replace the solid biomass fuel in the developing countries in South Asia and part of Africa.



During the activities in our **daily life**, there are still a lot of non-CO<sub>2</sub> **greenhouse gases** has been produced.

barbeque



emission of autobikes  
and automobiles

PM<sub>2.5</sub>、N<sub>2</sub>O ...



use of  
refrigerants



cow's rumination

CH<sub>4</sub> ...



# We have ability to **change!**

- 1 Once, our activities caused the depletion of **ozone layer**...an ozone hole occurred above Antarctica. Since the global collaboration for decades, the good new was released in 2018.



- 2 Nowadays, achieving the equable climate for our earth is the primary tasks for all nations by **reducing the greenhouse gas** emissions and mitigating the global warming.

- 3 Dr. Hansen and Prof. Ramanathan's works lay the scientific foundation for international actions as the Paris Climate Agreement and the new **global development-Agenda 2030**.

- 4 We believe that the climate changes and global warming can be mitigated and achieve to sustainable planet through the **global partnership**.

