# How to combine the climate issue with other development targets
# 如何将气候问题与其他发展目标相结合
## (Integrated) Multi target approach needed
## （综合）多目标方法


**Key note presentation 主旨演讲:**

Prof. Dr. Manfred Fischedick
Vice President 副所长
Wuppertal Institute 伍珀塔尔研究所

Seoul 首尔
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# Overview and central thesis 概述和中心论点

- **The climate change topic is without any doubt an burning issue - urgent need for action**

**气候变化问题毫无疑问是一个迫在眉睫的问题 - 需要迫切地采取行动**

- **Protecting the climate requires (amongst others) a complete change of the energy system – however there are many more underlying drivers for an energy system transformation**

保护气候需要彻底改变能源系统 – 然而能源系统转型有很多潜在驱动因素

- **Sustainable development needs more than protecting the climate -> Sustainable Development Goals**

**可持续发展不仅需要保护气候 →可持续发展目标**

- **Interactions between climate protection in form of synergies and trade offs have to be considered carefully**

**必须认真考虑其与气候保护之间的协同作用与权衡取舍**

- **Shaping the transition process to a sustainable system will follow certain phases and requires continuous learning as well as political and societal engagement at different levels**

**可持续系统转型将遵循某些阶段，需要不断学习，不同层面的政策机制和社会参与**

- **Shaping transition process to a sustainable system requires a new form of thinking/management (future literacy): (Integrative) Multi-target approach reflecting different dimensions and change of perspectives needed (from technological to cultural/political perspective) – particularly in cities**

**可持续系统转型需要一种新的思维/管理形式（未来的知识）:(综合）多目标方法考虑多维度以及所需思维变化（从技术到文化/政治的角度） - 特别是在城市**

# The climate change topic is without any doubt an burning issue - urgent need for action
# 气候变化问题毫无疑问是迫在眉睫的 - 需要迫切地采取行动

## UN climate change panel says 'unprecedented' action needed to prevent temperature rise

- Preventing global temperatures from rising beyond a tough target in the P aris Climate Agreement will take "unprecedented" action, a UN panel says.
- Temperature rise will surpass 15 degrees Celsius above pre-industrial levels without a "rapid and far-reaching" transition in energy , industry and transportation.
- The much-anticipated report paints a bleak picture of the world' s ability to prevent potentially catastrophic impacts of climate change .

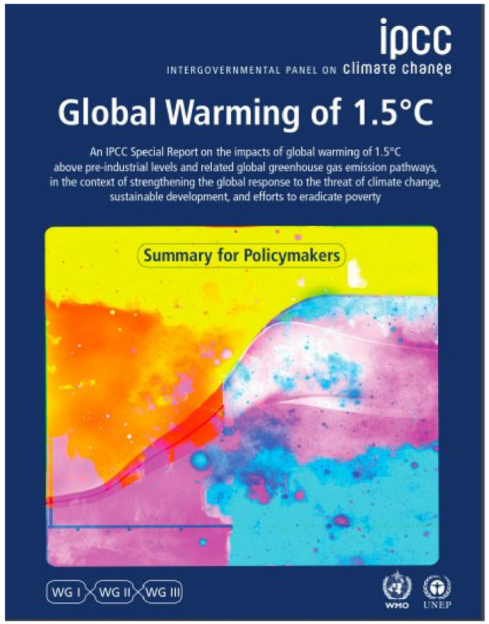
Tom DiChristopher | @tdichristopher

Published 8 Hours Ago

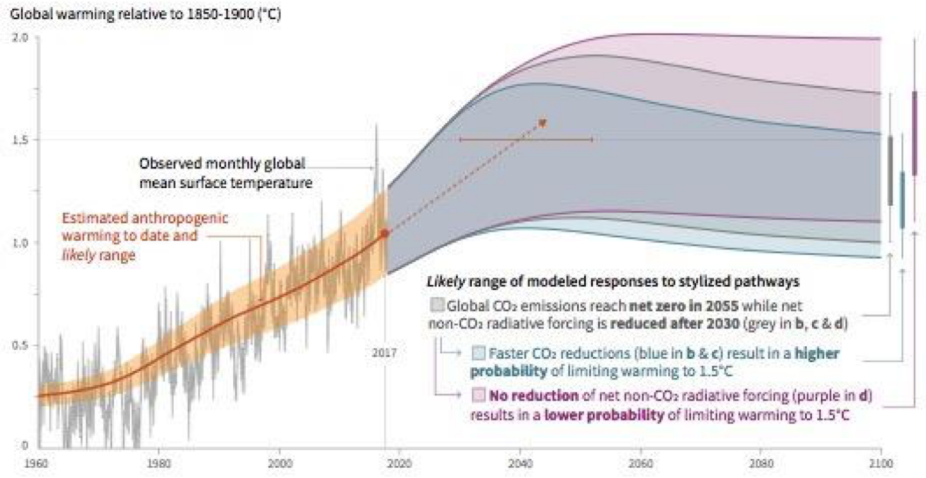
BUSINESS JOURN

## 联合国气候变化小组表示需要采取“前所未有的”行动来控制温度升高

- 联合国小组表示，将采取“前所未有的”行动以控制全球气温上升超出“巴黎气候协议”设定的目标。
- 如果没有采取能源、工业和交通方面“快速而深远”的转型，温度上升将超过工业化时代前水平1. 5摄氏度。
- 报告也描绘了全球防止气候变化所带来的灾难性影响的能力。




Getty Images



# The climate change topic is without any doubt an burning issue - urgent need for action
# 气候变化问题毫无疑问是一个迫在眉睫的问题 - 需要迫切地采取行动


**Klimadiskussion mit Politikern in Wuppertal**

在伍珀塔尔与政界人士进行气候讨论

- Worldwide attention helps to get things on the political and societal agenda – however solving the issue is for sure no easy sledding (”Selbstgänger”)

全世界的关注有助于将气候变化纳入政治和社会议程-但如何解决问题仍是挑战


Symbolfoto: dpa. Foto: dpa/Peter Zschunke

# Protecting the climate requires (amongst others) a complete change of the energy system – however there are many more underlying drivers for an energy system transformation
保护气候需要彻底改变能源系统 – 然而能源系统转型具有很多的潜在驱动因素

## Siginificant cost reduction of renewable energy technologies enables fast energy system transformation in developed and developing countries
可再生能源技术的成本显著降低，使发达国家和发展中国家都能够快速实现能源系统转型

Renewables costs versus new coal in India
(Levelised cost, Rs/Kwh)

# Sustainable development needs more than protecting the climate
# 可持续发展不仅需要保护气候

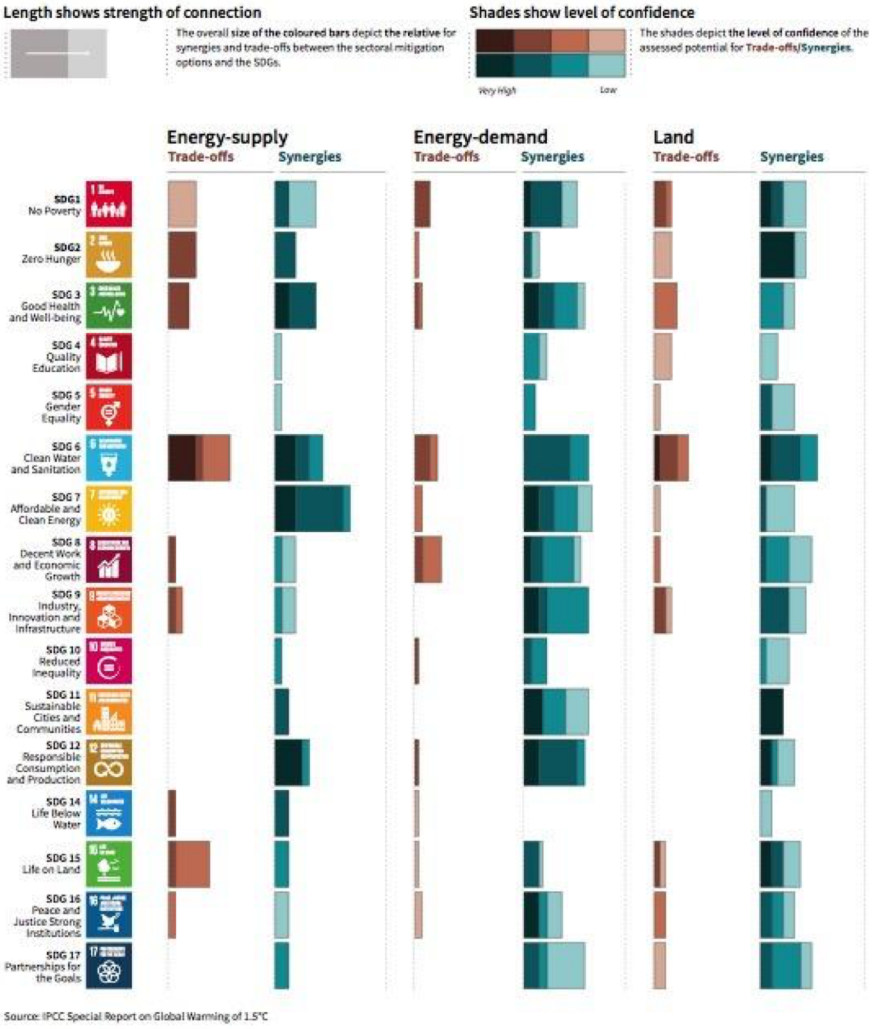
## Sustainable Development Goals
## 可持续发展目标

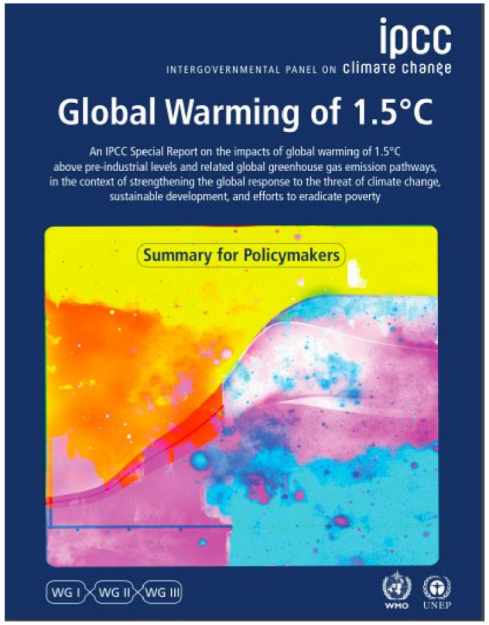
# Interactions between climate protection in form of synergies and trade offs have to be considered carefully

# 必须认真考虑以协同作用形式与权衡取舍进行的气候保护之间的相互作用

## Indicative linkages between mitigation options and sustainable development

## 减排方案与可持续发展之间的联系




Reflecting the various interactions -> (integrated) Multi target approach needed

反映各种相互影响 → （综合）多目标方法

# Interactions between energy system transformation (following SDG 7: affordable and clean energy) and the SDGs targets

能源系统转型（遵循可持续发展目标7：廉价和清洁的能源）与可持续发展目标之间的相互作用

## Indicative linkages between SDG7 and other SDGs

可持续发展目标7与其他可持续发展目标之间的指示性联系


Reflecting the various interactions ->

(integrated) Multi target approach needed

反映各种相互影响 →

（综合）多目标方法

PERSPECTIVE

nature energy

### Mapping synergies and trade-offs between energy and the Sustainable Development Goals

Francesco Fuso Nerini[1,2*], Julia Tomei[3*], Long Seng To[4,5], Iwona Bisaga[6], Priti Parikh[6], Mairi Black[1], Aiduan Borrion[6], Catalina Spataru[1], Vanesa Castán Broto[7,8], Gabriel Anandarajah[9], Ben Milligan[2*] and Yacob Mulugetta[2]


**The 2030 Agenda for Sustainable Development—including 17 interconnected Sustainable Development Goals (SDGs) and 169 targets—is a global plan of action for people, planet and prosperity. SDG7 calls for action to ensure access to affordable, reliable, sustainable and modern energy for all. Here we characterize synergies and trade-offs between efforts to achieve SDG7 and delivery of the 2030 Agenda as a whole. We identify 113 targets requiring actions to change energy systems, and published evidence of relationships between 143 targets (113 synergies, 65 trade-offs) and efforts to achieve SDG7. Synergies and trade-offs exist in three key domains, where decisions about SDG7 affect humanity's ability to: realize aspirations of greater welfare and well-being; build physical and social infrastructures for sustainable development; and achieve sustainable management of the natural environment. There is an urgent need to better organize, connect and extend this evidence, to help all actors work together to achieve sustainable development.**


On 5 September 2015, the 193 members states of the United Nations (UN) adopted a new 2030 Agenda for Sustainable Development. The 2030 Agenda succeeds the UN's Millennium Development Goals (MDGs), and features 17 Sustainable Development Goals (SDGs) with 169 targets, which UN members states have committed to implement by 2030. Energy was not explicitly referred to in the MDGs, and came to be referred to as the 'missing MDG'. During the operational period of the MDGs and negotiation of the 2030 Agenda, it was increasingly recognized that energy underpins economic and social development, without which it would not be possible to eliminate poverty. This change in status[1] made sustainable energy provision and access one of the central themes of the 2030 Agenda, whose preamble calls for "universal access to affordable, reliable and sustainable energy" and recognizes that "social and economic development depends of the sustainable management of our planet's natural resources"[2]. SDG7 is accompanied by five targets to be achieved by 2030: ensure universal access to affordable, reliable and modern energy services (7.1); increase the share of renewable energy in the global energy mix (7.2); double the global rate of improvement in energy efficiency (7.3); enhance international cooperation to facilitate access to clean energy research and technology (7.a), and promote investment in energy infrastructure and clean energy technology (7.b).

By understanding the complex links between the SDGs and their constituent targets, researchers can better support policymakers to think systematically about interactions between the different SDGs, including how actions to achieve each goal affect each other within and between sectors[3–5]. Studies to date[6] have lacked a target-level approach or have focused on only a few of the SDGs[7]. Here we present a formative attempt by an interdisciplinary group of researchers to identify the full range of goals and targets in the 2030 Agenda that call for changes in energy systems, and characterize evidence of synergies or trade-offs between delivery of each of the 169 targets and efforts focussed on pursuit of SDG7 and each of its constituent targets. The purpose of this Perspective is not to provide definitive answers. Instead we aim to lay a foundation for systematic (and context-specific) exploration of the interlinkages between each of the SDG targets, in the context of decision-making about development and the transformation of energy systems.

#### Energy systems and the 2030 Agenda

To assess each of the 169 targets in the 2030 Agenda and their respective interlinkages with energy systems, we undertook an approach designed to answer two questions: (i) Does the target call for action in relation to energy systems?; and (ii) Is there published evidence of synergies or trade-offs between the target and decisions about energy systems in pursuit of SDG7? 'Energy systems' were defined broadly to include all components of anthropogenic and environmental systems related to the production, conversion, delivery and use of energy. A systems perspective is crucial to understanding the practical complexity of energy provision and use, and facilitates effective intervention strategies[8].

Figure 1 illustrates our methods. To answer our first question, method (A) focused on identifying the normative implications of each target for energy systems. A consensus based qualitative content analysis was undertaken to identify each target's explicit (i.e. written in the text) normative content. The analysis was informed by Hall and Wright (2008)[9]. To answer our second question, method (B) focused on identifying evidence of empirical relationships (synergies or trade-offs) between the achievement of each target, and decisions about energy systems in pursuit of SDG7 (defined by its Targets 7.1, 7.2, 7.3, 7.a, 7.b). Synergies and trade-offs were identified and characterized using a consensus-based expert elicitation process, undertaken by the authors. Design of the expert elicitation

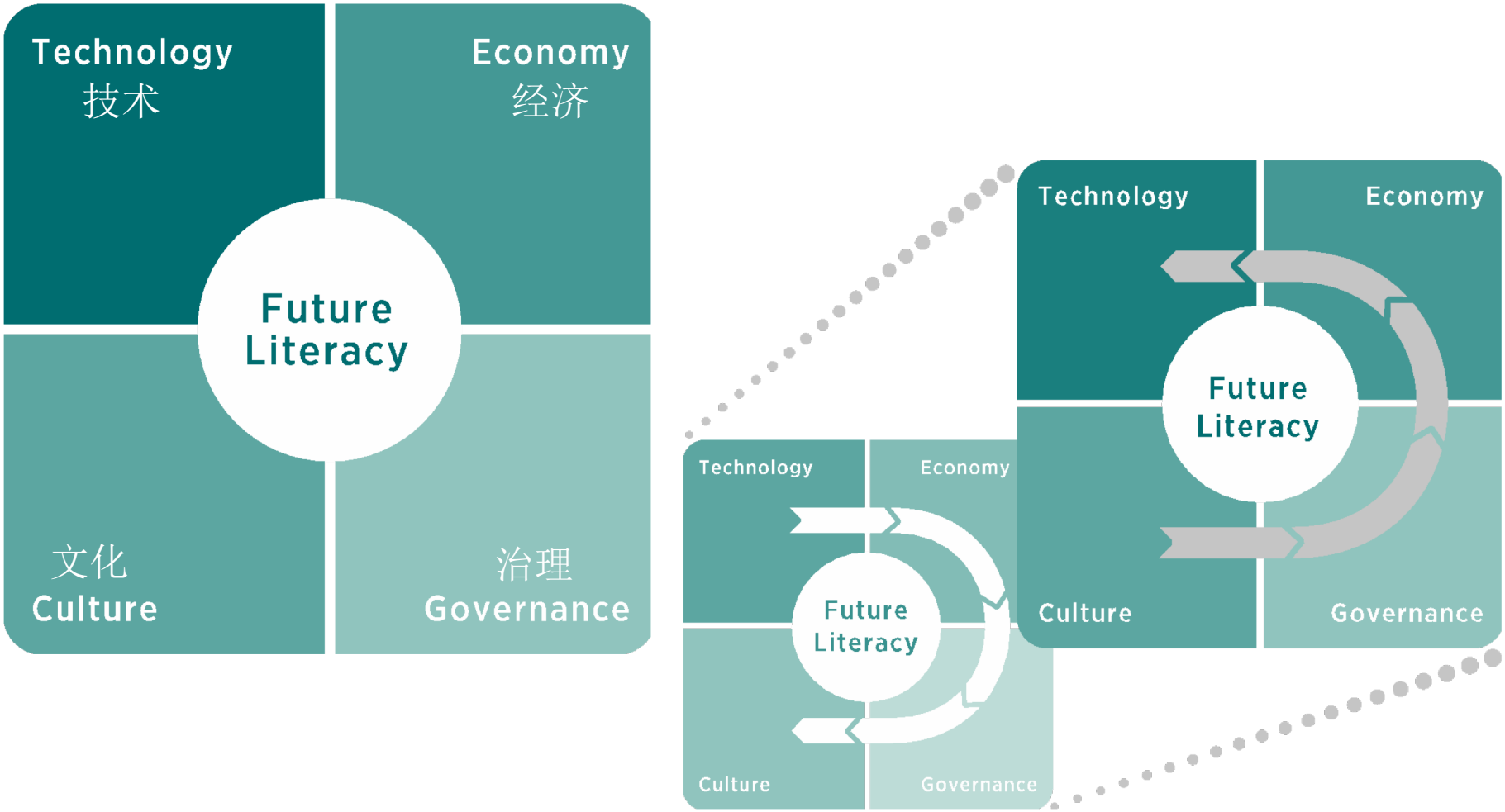

[1] UCL Energy Institute, University College London, London, UK. [2] Dept. of Energy Systems Analysis, (dESA), KTH Royal Institute of Technology, Stockholm, Sweden. [3] Centre for Sustainable Resources, CRE, University College London, London, U.K. [4] Department of Science, Technology, Engineering and Public Policy (D.C. STEaPP), University College London, London, UK. [5] Department of Geography, Loughborough University, Loughborough, UK. [6] Department of Civil, Environmental and Geomatic Engineering (CEGE), University College London, London, UK. [7] Development Planning Unit (DPU), University College London, London, U. C. [8] Faculty of Social Sciences, KODIS, University of Sheffield, Sheffield, U.K. [9] Faculty of Laws, University College London, London, UK.
*e-mail: francesco.fusonerini@ucl.ac.uk; julia.tomei@ucl.ac.uk; ben.milligan@ucl.ac.uk

Shaping transition process to a sustainable system requires a new form of thinking/management (future literacy)

将过渡过程转变为可持续系统需要一种新的思维/管理形式（未来的知识）

(Integrative) Multi-target approach reflecting different dimensions and change of perspectives needed (from technological to cultural/political perspective)

（综合）多目标方法考虑多维度以及所需思维变化（从技术到文化/政治的角度）




…..particularly in cities with their specific characteristics („Eigenart“)

.....特别是在具有特定特征的城市（“Eigenart”）

Shaping transition process to a sustainable system requires a new form of thinking/management (future literacy)
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Reflecting the diversity („Eigenart“) of cities is relevant with regard to: cultural background, underlying values, economic power, creativity, social cohesion, innovation capacities, transformation experience etc.
城市多样性（“Eigenart”）的反映与以下有关：文化背景，基本价值观，经济实力，创造力，社会凝聚力，创新能力，转型经验等。

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…..there is no silver bullet and no blueprint that works for all cities: tailor made approach needed
. . . . . 没有适用于所有城市的蓝图：需要量身定制的方法

# The good news at the end – transformation is possible and sometimes even faster than expected

# 好消息 – 转型是可能的，有时甚至比预期更快

Transformation is possible and sometimes even faster than expected
转型是可能的，有时甚至比预期更快
Transformation might go rather quickly under certain favourite conditions – no need to be to pessimistic?
在某些特定的条件下转型可能会很快 – 并不需要过于悲观？

Photo: Fifth Ave NYC on Easter Morning 1900 Source: US National Archives from (Wikipedia)

## New York 5th Avenue: the great horse manure crises 1894 and the impacts
纽约第五大道：1894年的大型马粪危机及影响

1900: Where is the car?车在哪里？

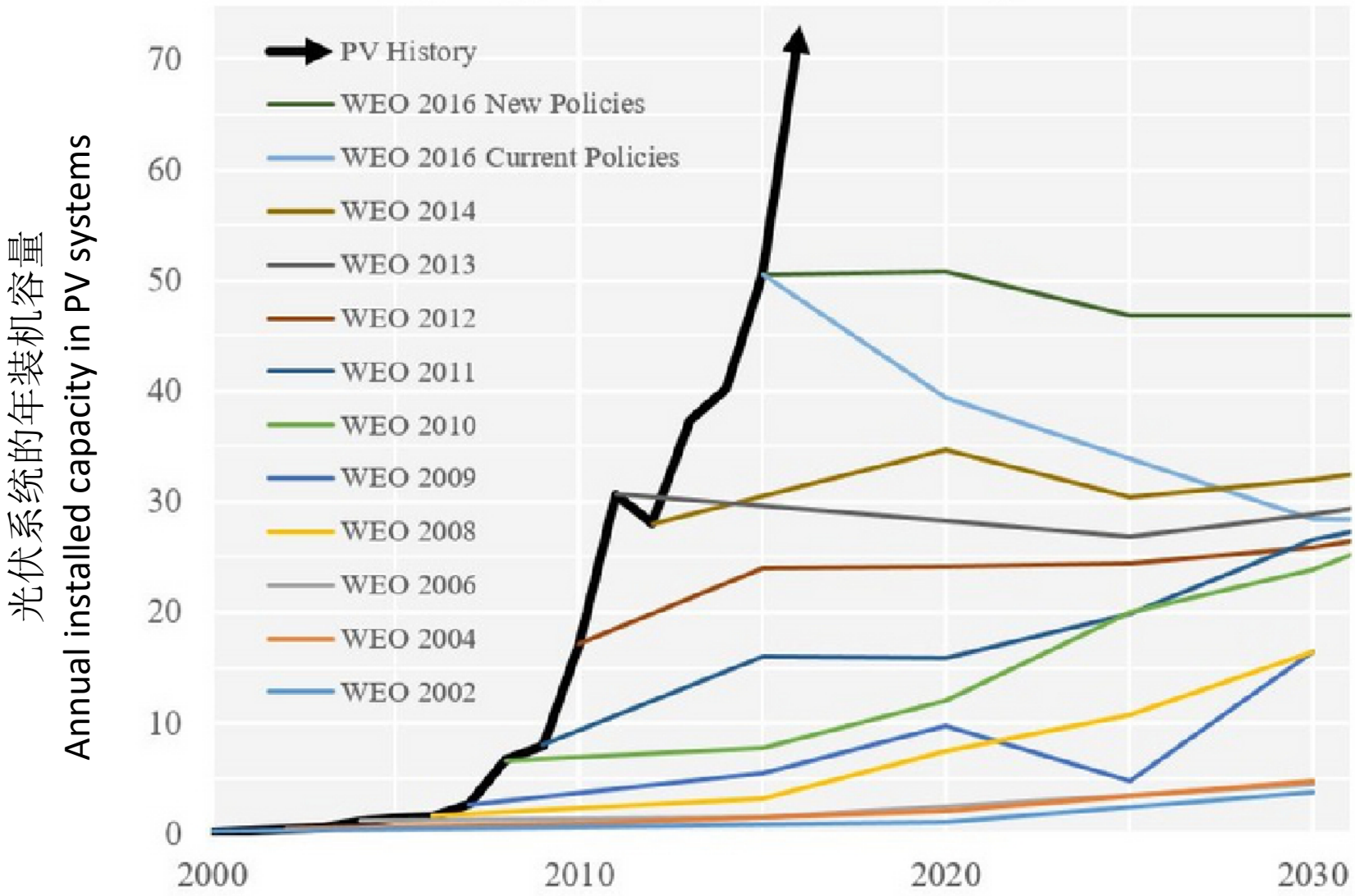
1913: Where is the horse?马在哪里？

Photo: Easter 1913, New York. Fifth Avenue looking north. George Grantham Bain Collection Source: shorpy.com

Are air quality issues and climate change in combination with shrinking costs of EVs (incl. batteries) the horse droppings of today?
空气质量问题和气候变化与电动汽车（包括电池）成本降低相结合是否就是今天的马粪？

# Transformation is possible and sometimes even faster than expected
# 转型是可能的，有时甚至比预期更快

## Market deployment of renewable energies has been signifcantly underestimated by IEA World Energy Outlooks
## 国际能源署世界能源展望显著低估了可再生能源的市场发展





来源: Hokestra 2017, Data from IEA 2017

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**Thank you for your attention!**

**谢谢你的关注！**