

Contested Trust in Technologies, Engineers, Knowledges—and Historians

Erik van der Vleuten

Keynote, 9th Gewina Meeting of Historians of Science in the Low Countries (Zeist, 17-18 June 2022)



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CONTESTED TRUST

HONEST History of Nuclear Energy and Society



Journal of Risk Research

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Introduction to the special issue "Trust, mistrust, distrust, and trust-building in the nuclear sector: historical and comparative experience from Europe"

Markku Lehtonen, Ana Prades, Josep Espluga & Stathis Arapostathis

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Downsides of excessive trust

virtues of **mistrust & distrust**

Prudent skepticism

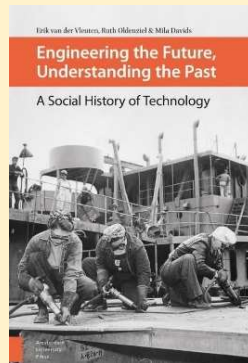
Mistrustful civic vigilance

Promise & confidence

Call: more research & conceptual refinement on roles of trust/mistrust/distrust in *regimes of promise* in tune with current era of apocalyptic threats

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1. CONSTRUCTING TRUST IN TECHNOLOGY & ENGINEERS



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1. CONSTRUCTING TRUST IN TECHNOLOGY & ENGINEERS Grand Challenges for Engineering



Global Grand Challenges Summits
(London 2013, Beijing 2015,
Washington DC 2017...)



ASSOCIATION AFFAIRS PRESIDENTIAL ADDRESS Science and Technology for Sustainable Well-Being

John P. Holdren

The American Association for the Advancement of Science (AAAS) is not about the advancement of science just for science's sake. Rather, as indicated by the Association's motto, "Advancing Science, Serving Society," it is about the advancement of science for the benefit of all.

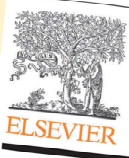
Science New Series, Vol. 319, No. 5862 (Jan. 25, 2008), pp. 424-434



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1. CONSTRUCTING TRUST IN TECHNOLOGY & ENGINEERS

Grand Challenges for Engineering: Building trust (1): promises



Engineering 2 (2016) 4-7

Contents lists available at ScienceDirect

Engineering

journal homepage: www.elsevier.com/locate/eng

Views & Comments

The Power of an Idea: The International Impacts of the Grand Challenges for Engineering

C. D. Mote Jr., Dame Ann Dowling, Ji Zhou
Presidents of the US National Academy of Engineering (NAE), Royal Academy of Engineering

Since the dawn of civilization, advances in the fields of engineering, science, and technology have played an indispensable role in shaping humans' social and economic development. Now people face a host of global challenges that must be addressed through long-term and innovative education, research, and engineering solutions. Recognizing the growing importance of these problems, a select group of experts in 2008 identified the Grand

zation, cultural diversification, and global communications, which have reduced distances and barriers between nations and people. Accompanying these changes are significant challenges to the survival and continued development of the world as we know it.

Sustainable growth is essential to modernization. Since the

TRUST: PROMISES

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1. CONSTRUCTING TRUST IN TECHNOLOGY & ENGINEERS

Grand Challenges for Engineering: Building trust (2): confidence (Mobilizing history)

sufficiently compelling, others adopt it too, thereby growing the movement. As the Grand Challenges movement grows, everyone will benefit.

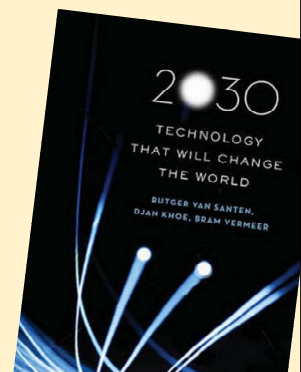
Engineering has solved problems of a magnitude comparable to those of the Grand Challenges before. It has linked the world's inhabitants through innovations in transportation and communication unimaginable in previous generations. It has brought improved health and security and created devices and systems that feed more than 7 billion people. And it is constantly evolving to address current and future challenges.

Looking to the future, a coherent, coordinate response to the Grand Challenges movement is needed.

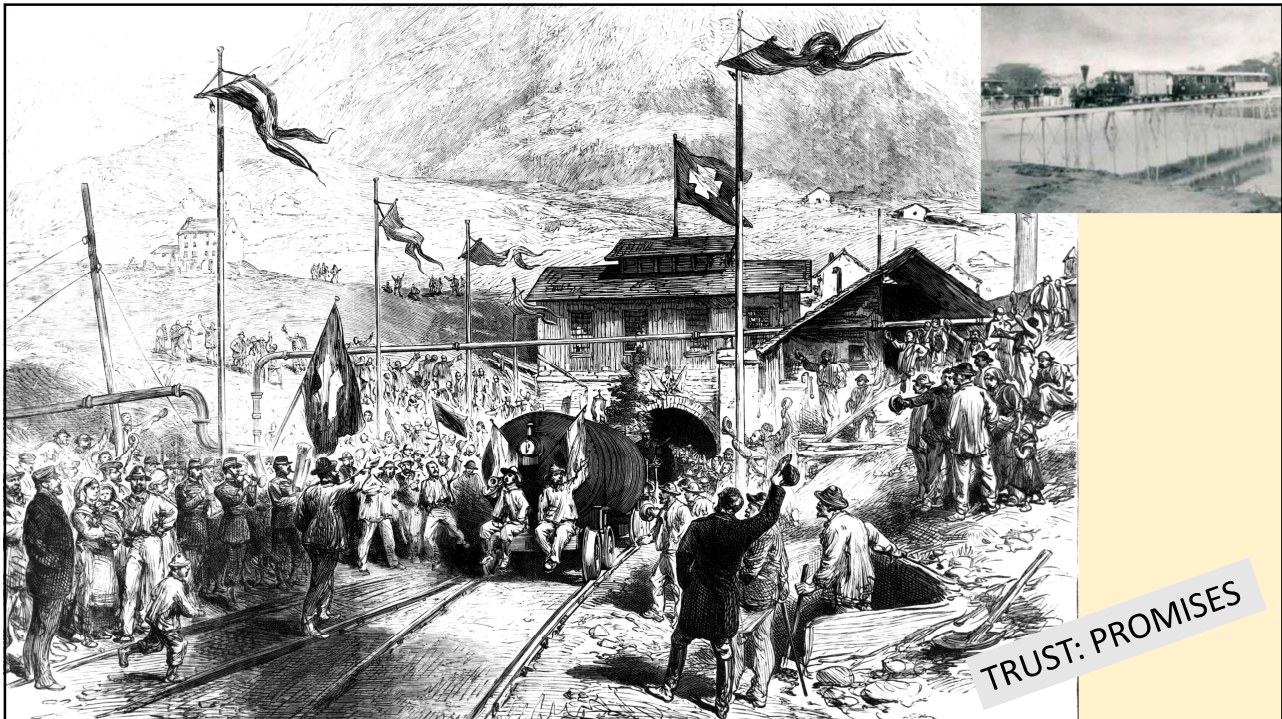
TRUST: CONFIDENCE

Argument engineering institutions in 2010s:

1. **Technology has solved major challenges in the past (can do)**
2. **Because technology was implicated in making our crises, it holds the key to the solution**



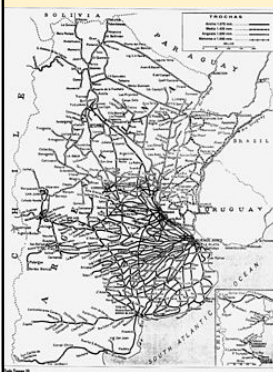
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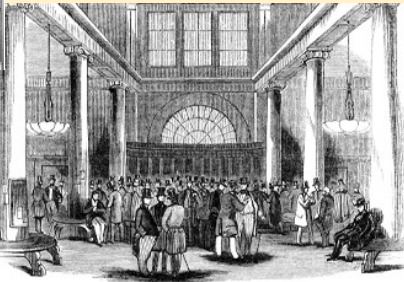
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1. CONSTRUCTING TRUST IN TECHNOLOGY & ENGINEERS

Appropriating promises: Railways & business



TRUST: PROMISES



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1. CONSTRUCTING TRUST IN TECHNOLOGY & ENGINEERS

Promises & confidence



'engineer' protected title
Promotierecht
(1899 D/ 1905 Delft)



The general advancement of mechanical science, and more particularly for promoting the acquisition of that species of knowledge which constitutes the profession of a civil engineer; being the art of directing the great sources of power in nature for the use and convenience of man, as the means of production and of traffic in states, both for external and internal commerce, in the construction of roads, bridges, aqueducts, canals, docks, for internal intercourse and exchange; and in the construction of ports, harbours, moles, breakwaters, and light-

TRUST: PROMISE &
CONFIDENCE

Institution of Civil Engineers (8 young engineers, 1818), Royal Charter 1828

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1. CONSTRUCTING TRUST IN TECHNOLOGY & ENGINEERS

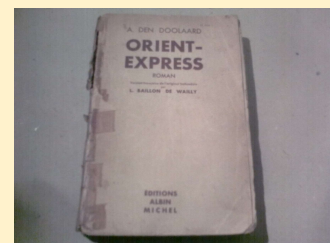
Appropriating promises: Unforeseen railway uses...

... and promise turns into nightmare (the demise of confidence, omnipresent mistrust and distrust)



370mm gun Mle 1915

MISTRUST & DISTRUST:
LOSS OF CONFIDENCE





Great War = an
Engineers' War



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Fritz Haber, Chemical Warfare, *Nature* 109 (1922): 40



American Chemical Society: pledges aid of 15.000 members to US Chemical Warfare Service

**MISTRUST & DISTRUST:
LOSS OF CONFIDENCE**

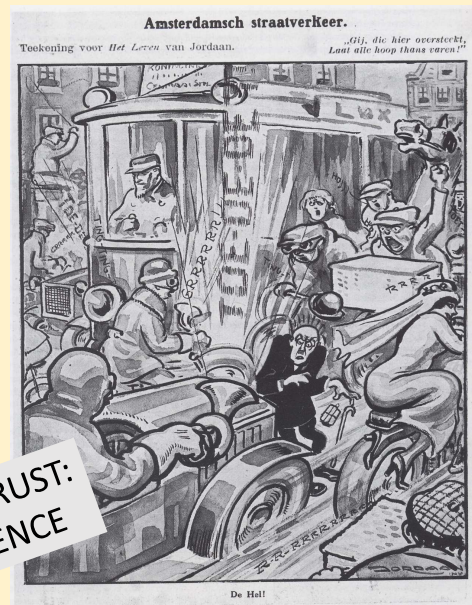
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MISTRUST & DISTRUST:
LOSS OF CONFIDENCE



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1. CONSTRUCTING TRUST IN TECHNOLOGY & ENGINEERS

US & Europe's thirty years crisis

Confidence lost: Mistrust & distrust

LOSS OF CONFIDENCE

In the drama of civilisation, the engineer suddenly finds himself called from manipulating the properties in the back-scene and the wings to play a leading role in the center of the stage, and the public is not yet sure whether he is the hero or the villain of the piece.⁵⁵

William Wickenden, President Case
School of Applied Science, 1932

MISTRUST

Science fiction in the Interwar years:

Hero: (1) scientists & engineers, (2) ...

Villain: (1) scientists/engineers, (2) businessmen, (3) politicians, (4) criminals ...

Walter Hirsh, *The image of the scientist in science fiction* (1958)

DISTRUST

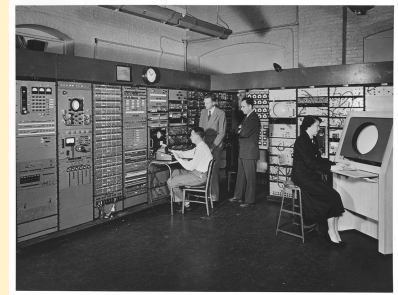


Engineers in
totalitarian regimes...

DISTRUST

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1.CONSTRUCTING TRUST IN TECHNOLOGY & ENGINEERS
Restoring confidence: Technocratic & participatory innovation



Technocracy is the science of social engineering, the scientific operation of the entire social mechanism to produce and distribute goods and services to the entire population of this continent. For the first time in human history it will be done as a scientific, technical, engineering problem. There will be **no place for Politics or Politicians, Finance or Financiers, Rackets or Racketeers.**⁶⁵

(Technocracy journal, 1937)

RESTORING CONFIDENCE

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1.CONSTRUCTING TRUST IN TECHNOLOGY & ENGINEERS
Restoring confidence: Technocratic & participatory innovation



- **de-politicize technology:** engineers set the innovation agenda
- **Technify politics:** solve complex societal challenges through systems approach, modelling, simulation...
- **Engineers:**
 - Influence & numbers
 - Theory >> practice ("engineering sciences")
 - Man-machine interaction: interdisciplinarity, humanities & social science training, etc
 - Ethical codes: public interest >> employer interests
- **Villains** in science fiction: totalitarian regimes, mega-companies..

RESTORING CONFIDENCE

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1.CONSTRUCTING TRUST IN TECHNOLOGY & ENGINEERS
Restoring confidence: Technocratic -> participatory innovation

As engineers and scientists we are all painfully aware that ... the word "technology" has become synonymous with pollution and war. Our young people are no longer impressed with the man-on-the moon accomplishment. The fact that our problems require more and better technology has failed to penetrate the din of rock and roll or whatever piper is predominant at the moment.¹

(Stanley Burris,
 President
 Lockheed, 1971)

**MISTRUST & DISTRUST:
 LOSS OF CONFIDENCE**

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1.CONSTRUCTING TRUST IN TECHNOLOGY & ENGINEERS
Restoring confidence: Technocratic & participatory innovation

Public & stakeholders set the innovation agenda

- Public participation incl hearings & technology assessment tools (e.g. citizen conferences, stakeholder consultation & co-design etc),
- human-centered & participative design,
- open innovation,
- Appropriate Technology movement,
- Science Shop movement,
- practice >> theory

Also subverted/ hijacked etc..

2010s: and so the engineering sciences and scientists muddle on losing & restoring trust...

- combine the best of technocratic & participative
- Reflection loses out to digital transition & commerce

**Vindkraftværket
 Tvindkraft (1975-78)**



RESTORING CONFIDENCE

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1. CONSTRUCTING TRUST IN TECHNOLOGY & ENGINEERS

More research ...



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PART 2: MISTRUSTING SCIENCE

- *Post-truth, COVID, decolonization debate...*
- Own context:
 - Transition studies, 'Sustainability science'
 - Historiography of Science, Technology, and Sustainability

FOCUS ON 2 CHALLENGES

1. connecting imaginaries of past and future
2. ontological and epistemic decolonization debates

SUGGESTIONS:

Start a careful and reflective conversation that embraces (voices) mis/distrust, incl

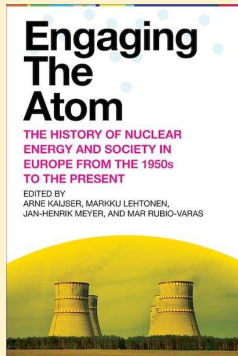
- KNOWLEDGE POLITICS PERSPECTIVES
- TRANSNATIONAL & TRANSDISCIPLINARY RESEARCH/STUDENT/SOCIETAL PARTNER NETWORK

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PART 2. MISTRUSTING SCIENCE, NOTABLY HoSTS

History of Technology as trust-building: EURATOM & the HoNESt experience

HoNESt History of Nuclear
Energy and Society



MISTRUST
DISTRUST

Kirchhoff, A. M., & Meyer, J. H. (2021). Vielfach nachgefragt: Kernenergiegeschichte. *Technikgeschichte*, 88(4), 391-398.

Vielfach nachgefragt: Kernenergiegeschichte
VON ASTRID MIGNON KIRCHHOF UND JAN-HENRIK MEYER

Dass (Anti-)Atomkraftgeschichte auf ungebrochenes gesellschaftliches Interesse stößt, bietet der Forschung sowohl in ihrem inner-akademischen Diskurs als auch in der sogenannten *public history* vielfältige Möglichkeiten. Davor profitieren die Zeit-, Technik- und Umweltgeschichte insofern, als entsprechende Einrichtungen, sondern nicht nur von einschlägigen Förderungseinrichtungen, sondern auch von der Europäischen Union, Bund oder Länder finanziert wird. Die langen Dauer des Atomkonflikts. Die Einandersetzung um das Kernenergiegeschehen -- bis heute --

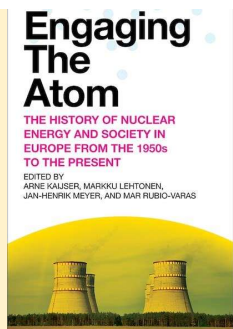
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PART 2. MISTRUSTING SCIENCE, NOTABLY HoSTS

Epistemic (de)colonization?



HoNESt History of Nuclear
Energy and Society

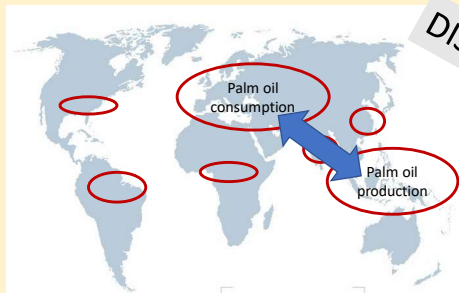


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PART 2. MISTRUSTING SCIENCE, NOTABLY HoSTS

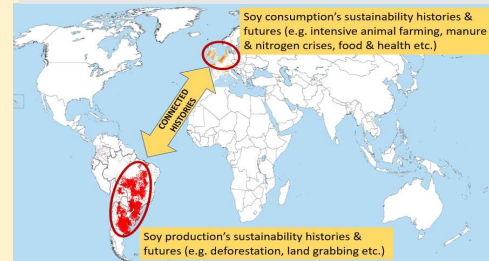
Epistemic (de)colonization?

Epistemic decolonization 1: critique
'Western' blindness & power



Connected sustainability histories of palm oil (de Hoop, vd Vleuten 2022a)

Epistemic decolonization 2: make visible
situated knowledges understandings etc



Connected sustainability histories of soy (de Hoop, vd Vleuten 2022b)

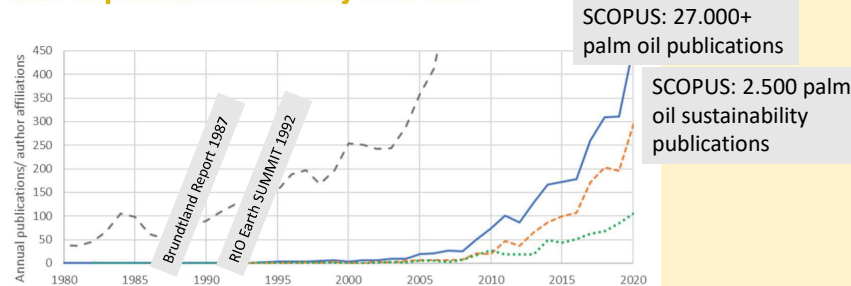
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PART 2. MISTRUSTING SCIENCE, NOTABLY HoSTS

Epistemic (de)colonization?

PALM OIL SUSTAINABILITY RESEARCH

Figure 1. Spatio-temporal distribution in Scopus publications on palm oil sustainability 1980–2020



de Hoop, E., vd Vleuten, E. (2022). Sustainability Knowledge Politics: Southeast Asia, Europe, and the Transregional History of Palm Oil Sustainability Research. *Global Environment*, 15.2: 209-245

'domestic sustainability'
research line



'global promise'
research line

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PART 2. MISTRUSTING SCIENCE, NOTABLY HoSTS Epistemic (de)colonization?

Box 1: Pasts & futures in selected soy hi/stories

Factory farming histories of the 1990s:

- **HISTORICAL PROBLEM:** post-war survival of sandy soil smallholder communities as the chief historical problem.
- **SOLUTION:** 'industrial' entrepreneurship and innovation → factory farming. New problems: also solve through agricultural entrepreneurship and innovation

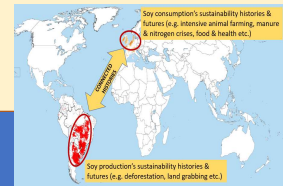
Manure crisis/ Nitrogen Crisis histories (since 1990s)

- **HISTORICAL PROBLEM:** manure slurry emissions and poor policy responses
- **SOLUTION:** sector downsizing, to be realized through better policies.

Dutch Soy Coalition reports (2003-2018)

- **HISTORICAL PROBLEM:** domestic Dutch agriculture wreaking havoc in American bioregions
- **SOLUTION:** certification of responsibly produced soy

in: The Age of the Soybean. A global environmental history of the Soyacene (in press).



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PART 2. MISTRUSTING SCIENCE, NOTABLY HoSTS Epistemic (de)colonization?

**Transnational & transdisciplinary research,
teaching, societal partner network** on what
we tentatively call 'plural sustainability
histories & futures'

Tensions of Europe experience:
build **conversation**, do **not assume trust**, include **mistrust & distrust**
(civic & academic vigilance and disobedience)

Existing networks &
dynamics

???

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THANK YOU FOR YOUR ATTENTION!!