



## THE GERMAN ENERGY POLICY IN CHANGE: RENEWABLES, FOSSIL FUELS, ENERGY EFFICIENCY AND THE INNOVATION PIPELINE

IEA EBC-Webinar 07.06.2022

Dr. Dirk Bessau, Project Management Juelich (Projekttraeger Juelich), division manager „energy and climate“

### AGENDA

- > Introduction Project Management Juelich and Dirk Bessau
- > The orientation in the German Energy policy
- > „Thinking from the end“ – the steps toward the energy system of the future
- > The „innovation pipeline“ in Energy Research, Development and Innovation support
- > Summary

## OUR SERVICES

### IDENTIFYING TRENDS

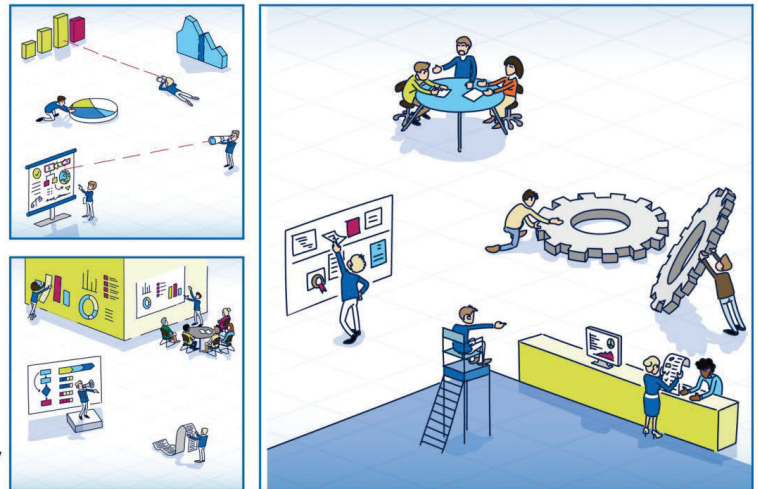
- › Innovation and technology analyses
- › Identification of new funding approaches
- › Advice on funding strategy
- › Development of funding programmes

### SUPPORTING RESEARCH AND INNOVATION

- › Advice on national and European funding
- › Evaluation of applications
- › Management of funding projects
- › Audit of the use of funds and exploitation of results

### CREATING THE FUTURE

- › Impact analyses and evaluation processes
- › Transferring knowledge to the specialist community and society
- › Committee work developing programmes



## OUR BUSINESS AREAS

### ENERGY AND CLIMATE

- › Energy efficiency and storage
- › Renewable energies
- › System integration and sector coupling
- › Regulatory sandboxes for the energy transition
- › Smart Energy Showcases
- › Electric mobility, hydrogen, and fuel cells
- › Municipal climate protection
- › Rural development
- › Systems analysis

### SUSTAINABLE DEVELOPMENT AND INNOVATION

- › Sustainability and circular economy
- › Basic energy and hydrogen research
- › Bioeconomy
- › Marine, coastal, and polar research
- › Geosciences
- › Maritime technologies
- › Life sciences and health research
- › Materials research and chemistry
- › Start-up companies and technology transfer
- › Regional innovations

### RESEARCH AND SOCIETY NRW

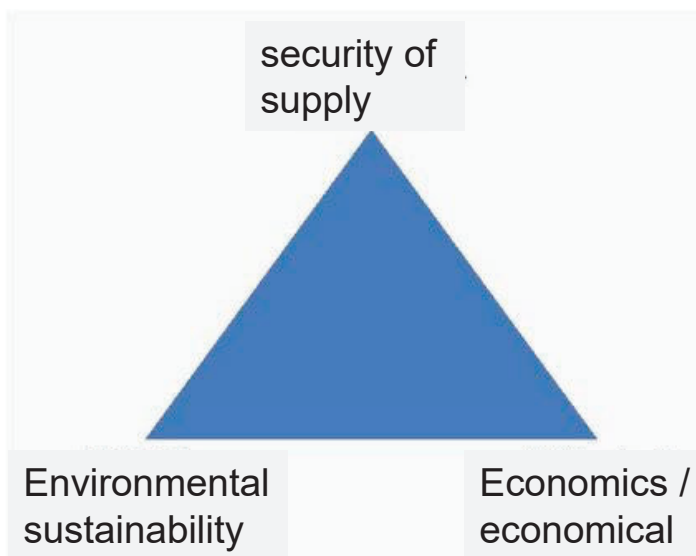
- › Energy; environmental and climate protection
- › Health economy and life sciences
- › Digitization
- › New media
- › Production and materials
- › Electric mobility, mobility, and logistics
- › Social innovations
- › Universities and culture
- › Funding start-ups and small and medium-sized enterprises
- › Regional development



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## THE „MAGIC“ TRIANGLE



Changes over time, e.g.:

- development of a centralised, hierarchical power system and system of gas supply
- national fossil resources: brown coal
- nuclear research and energy
- first prove of concepts in renewable energy
- energy market liberalisation („big bang“ liberalisation)
- renewable energy act, fast development of renewable energy → system integration
- discussion on „bridge technologies“
- 100% RE goal in power, „climate neutrality“ 2045
- security of supply / attack on Ukraine: renewable energy expansion

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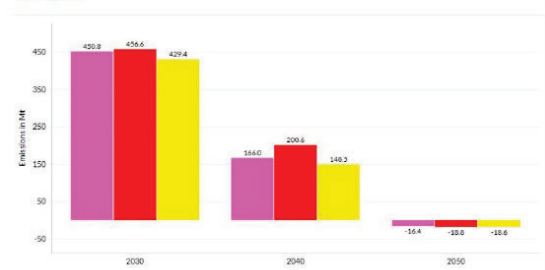
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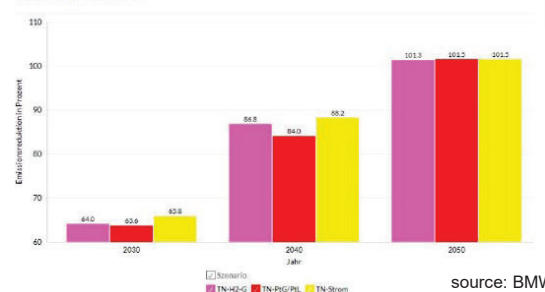
## THE LONG TERM AND MID TERM TOPICS

- > Year 2040 / 2045
  - > to be on track for the 1,5 C – goal
  - > 80-95%-GHE reduction
  - > „climate neutral“
  - > based on renewable energy across the sectors
  
- > Year 2030
  - > 63-65% GHE reduction
  - > speed up RE growth for power production
  - > focus on heat/cooling and mobility

TNG Emissionen



Emissionsreduktion nach Szenario

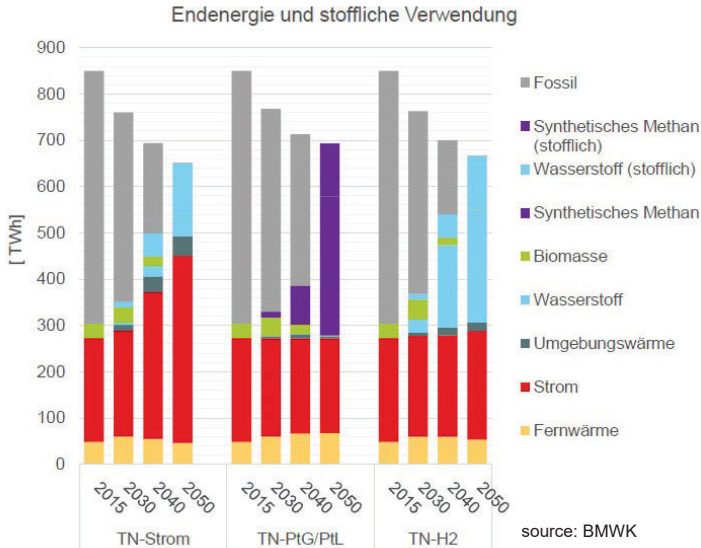


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Name der Präsentation / Referent, Geschäftsbereich

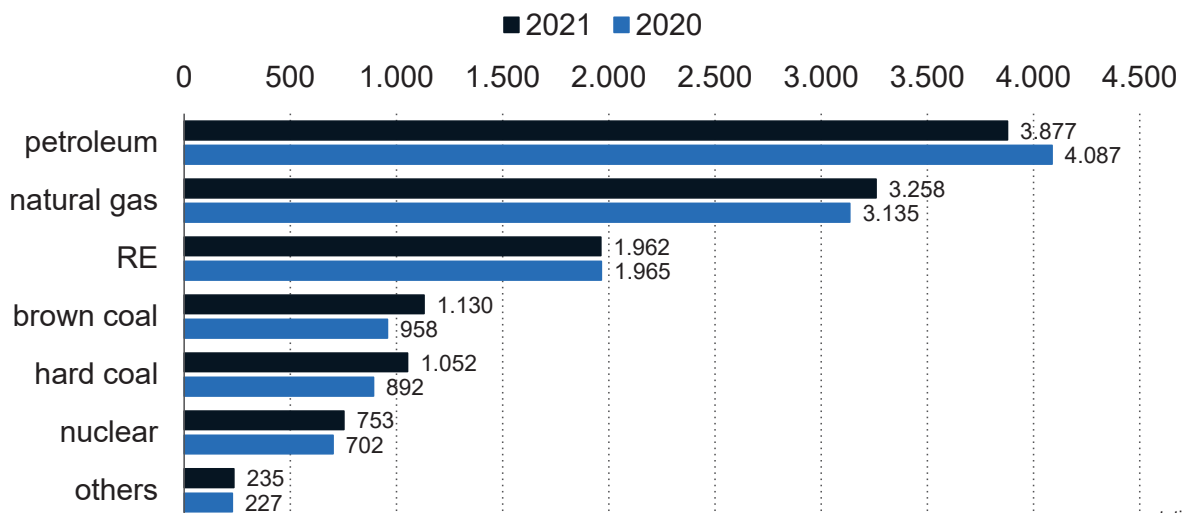
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## THE ENERGY INDUSTRY IN CHANGE



- > Different ways for the 1,5C-path are in discussion
- > For example: RE power based scenario, PtG/PtL scenario, green H2 scenario
- > basically, the change is about to speed up production capacities in wind and power
- > and increase energy efficiency.
- > There will be solution contributions needed from green H2, e-mobility (cars) and PtL/PtG, especially from 2030 on.
- > The war in Ukraine changes the security of supply fundamentally.

## WHERE DO WE ARE? PRIMARY ENERGY CONSUMPTION 2021/2020



## WHERE DO WE ARE? ENERGY CONSUMPTION FOR HEATING/COOLING, POWER AND MOBILITY 2020

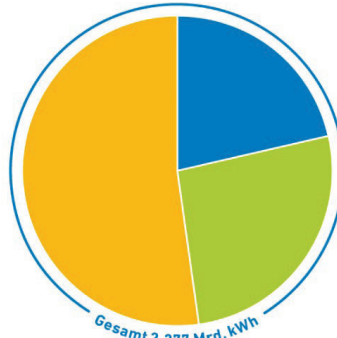
heating  
and  
cooling

### Endenergieverbrauch in Deutschland im Jahr 2020 nach Strom, Wärme und Verkehr

in Milliarden Kilowattstunden; der Stromverbrauch für Wärme und Verkehr ist im Endenergieverbrauch Strom enthalten.



Wärme und Kälte  
(ohne Strom):  
1.185,9 Mrd. kWh  
52,1 %



Nettostromverbrauch:  
487,7 Mrd. kWh  
21,4 %

power



Verkehr (ohne Strom  
und int. Luftverkehr):  
603,5 Mrd. kWh  
26,5 %

mobility

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Quelle: eigene Darstellung auf Basis von AGEb, AGEE-Stat; Stand: 3/2021  
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AGENTUR FÜR  
ERNEUERBARE  
ENERGIEN

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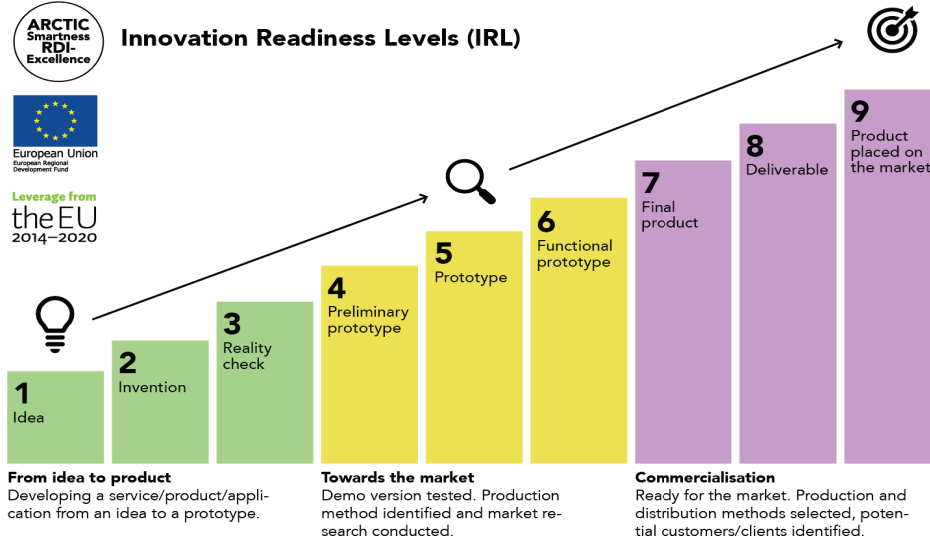
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## THE INNOVATION PIPELINE AND THE PUBLIC R&D&I-SUPPORT



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## ONE STRATEGIC ELEMENT IN PUBLIC R&I-SUPPORT IN ENERGY: ENERGY RESEARCH PROGRAMME



- > Strategic element of energy policy since 1977
- > 2018:
  - > launch of current 7th program
  - > Common program of BMWi and BMBF
  - > > 500 Mio € per year

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## 7<sup>TH</sup> RESEARCH PROGRAM „INNOVATIONS FOR THE ENERGY TRANSITION”

- > Primary goal of research funding:
  - > Support the transition to a climate neutral energy supply
  - > Increasing the usability of innovative energy technologies
- > Research on technologies and concepts that offer
  - > Significant increases in efficiency
  - > Integration of renewable energies
  - > Ensuring security of supply
  - > And a rapid transfer of research results to the application and into the market
- > Key ideas
  - > Technology-open approach
  - > Adoption of new trends: sector coupling or the digitisation of the energy sector
  - > Offer opportunities for innovative companies in the national market

## 7<sup>TH</sup> RESEARCH PROGRAM

- > Four focus areas
  - > Energy in the end use sector (buildings and communities, industry, mobility)
  - > Energy supply and electricity generation (wind, PV, bioenergy, geothermal etc.)
  - > System integration (power supply system, grids, energy storage and sector coupling)
  - > Cross-system research topics (system analysis, “energy transition and society”).
- > Digitalisation is a major R&D topic in all of the focus areas
  - > digital twins, digital planning, digital concepts for district heating and cooling networks, plant monitoring and asset management,...
  - > However: Digitalisation processes are currently more advanced in the area of electricity than in the area of heat supply
- > Current development
  - > Additional support for climate neutral heat supply



## NEW PILLAR 7<sup>TH</sup> RESEARCH PROGRAM: LIVING LABS

- > Focus on the transfer of technologies and innovations into daily life
  - > Preparing the market for innovative solutions
- > Concentration energy system relevant problems to push forward the energy transition
  - > City districts und multi-energy infrastructure, district heating, Hydrogen production and use, Digitalization
- > Improved integration of additional funding formats for plant technology and infrastructure



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## SUMMARY

- > A new orientation in the “magic” energy triangle with the war in the Ukraine: security of supply, environmental sustainability and economics support each other
- > As a consequence, for the path for the 2040/2045-goals (“thinking from the end”) we have to speed up the transformation into RE and energy efficiency
- > Besides RE from wind and solar, heating/cooling and mobility are on the top of the agenda
- > That means, „Wärmewende“ becomes more important
- > Especially in the long run, we need an even more filled innovation pipeline

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