HMS‘s position on energy policy

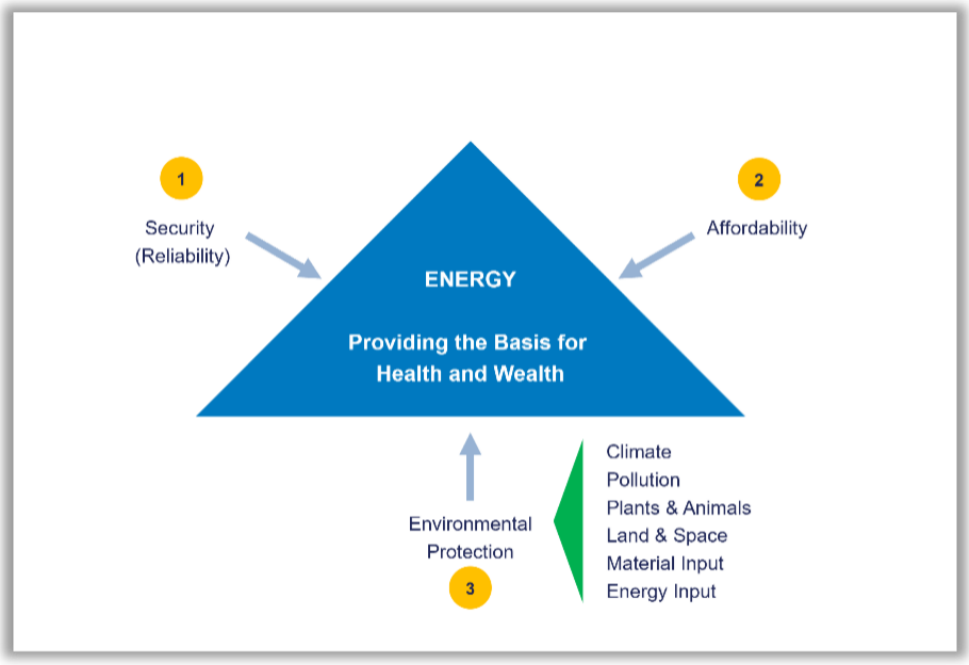
Today, there is no longer any doubt as to the fact that the “energy transition” has not even begun in absolute terms from a macroeconomic perspective. Only a portion of global energy growth has been covered by wind and solar, so a reduction in coal, oil and gas has not yet taken place. While economically stagnating or shrinking countries like Germany are able to reduce their coal, gas and possibly even oil consumption, the majority of countries around the world are still a long way from being able to initiate the ‘turnaround’ in the first place. Instead, the consumption of conventional energy sources reaches new record highs year after year, except during global recessions.

Globally, oil, coal and gas have accounted for decades for an almost unchanged 80% of total energy supply (primary energy). In Germany this figure was around 77% in 2023, more than 20 years after the start of the “energy transition” (Primary consumption). In 2024, wind and solar contributed around 7 % to primary energy generation globally, compared to 8 % in Germany.

HMS’s executive bodies, in coordination with the Supervisory Board and principal shareholders, have agreed on the following statement concerning long-term energy policy:

1. Energy policy means (a) first guaranteeing 100 percent availability and reliability, (b) only then can affordability be ensured, (c) once energy is secure and affordable, it can be optimised to reduce the environmental impact. There is no form of energy without a negative environmental impact. If such energy existed, it would only be helpful if it were affordable and safely available.

2. HMS supports an energy policy that focuses on reducing environmental impact with the help of latest technologies, without compromising reliability and affordability. Environmental protection is achieved primarily through investments in efficiency improvement and the latest production, transport, and filtration systems.



3. In our opinion, an unchecked expansion of weather-dependent wind and solar installations is not effective – for the environment nor for the economy – for the following three key reasons:

   a. **Low energy density**: Technology is not capable of increasing the low power output per square meter from the so-called abundant wind and solar resources.

   b. **Short operating lifespan**: Wind and solar power plants must be replaced, at disposed of, at least twice, and often three or four times as often as conventional thermal power plants.

   c. **Intermittency**: In Germany, a solar plant operates 10% of the year; the rest of the time it sits unused. We do not know when that 10% usage will occur, only that it will not occur at night.

   d. **High costs**: Solar and wind in the overall system (at the national level, starting from a relatively low level basis of penetration) are always the most expensive way to provide electricity – more expensive than nuclear power. They become more expensive the higher their share of installed capacity. This counterintuitive conclusion is based on the fact that wind and solar require the following:

      - **Extensive overbuilding** to overcome the low natural utilisation rate, which leads to low-capacity usage, and to manage the challenges of intermittency and unpredictability, and to charge any storage systems.
      - **Short-term energy storage** e.g. in the form of batteries to overcome short-term fluctuations and balance the grid.
      - **Long-term energy storage** e.g. in the form of hydrogen to bridge days and weeks with insufficient combined wind and solar power generation.
      - **Backup power** plants kept on standby as needed; in Germany, 12–20 GW of gas will be required by 2030; in the future, this reserve is to be operated using hydrogen. They are therefore still necessary.
      - **A significantly more complex and larger transmission network** and integration infrastructure.

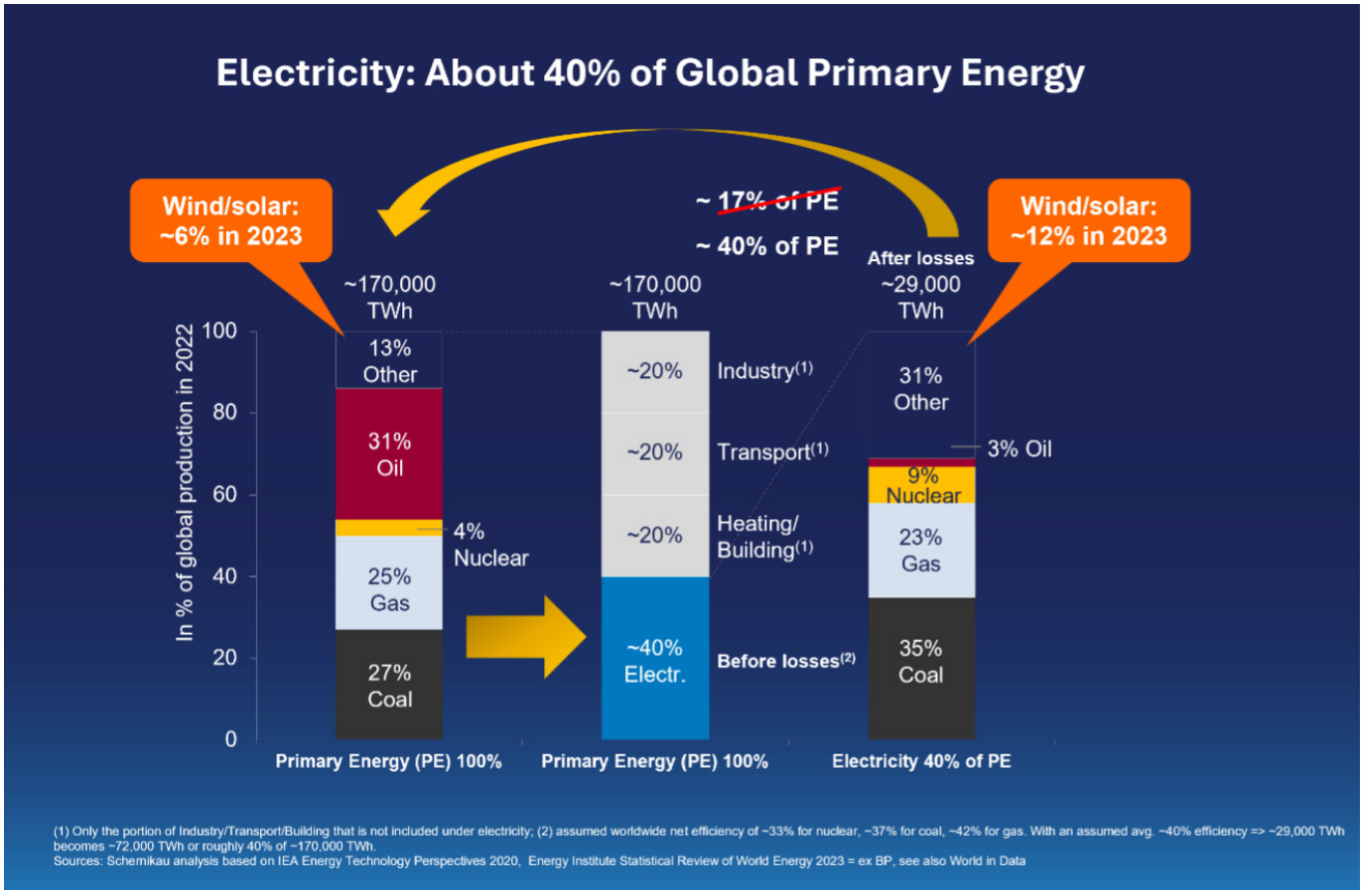
   e. What are the consequences of an uncontrolled expansion of wind and solar?

      - **Environmental consequences**: It is obvious that the short lifespan and large-scale installations of wind, solar, and auxiliary systems must not only be replaced but also disposed of every few years. Moreover, the low energy density and the resulting extensive land use have direct impacts on flora, fauna – such as whales, birds, and insects— and on the local climate, including humidity and temperature.
      - **Economic costs**: We now also know that the large-scale overbuilding and auxiliary systems (storage, backup, grids) that are required to make wind and solar energy usable come with high economic and ecologic costs.

4. Conventional energy sources, including coal and gas, also have environmental and sometimes economic challenges. To address these challenges, we recommend the following:

    a. **Investment in research and development**: By providing funding for innovative research and development, we can work toward an energy future that is both economically viable and environmentally sustainable. A "new energy revolution" will enable us to reduce the use of fossil fuels without the compromises currently required by wind and solar solutions.

    b. **Improving existing energy systems**: Until the "new energy revolution" becomes reality, investments in our current energy infrastructure and in thermal power plants must contribute to meeting both current and future energy needs. By increasing the efficiency of these systems, we can reduce their environmental footprint while ensuring reliable energy supply. We explicitly support nuclear power, but it will not be sufficient.



HMS BERGBAU AG
commodities for the future

HMS Statement on coal:
Why coal will continue to be an indispensable energy source into the future

In these times of “sustainability” and “ESG”, coal, in particular, is more vigorously debated than ever. For some, it is the “black sheep” among energy sources; for others, it remains a practical and essential means of ensuring reliable power generation, heat supply for home and industrial markets, as well as providing a carbon source for metallurgical products such as steel.

What is certain is that coal will continue to play a vital role in global energy supply for decades to come - especially with the latest power plant technologies to minimise environmental impact.

Despite the expansion of wind and solar energy, coal remains a key pillar of energy security, particularly, but not only, in emerging economies, which are catching up. Genuine progress in global environmental sustainability can only be achieved if the international community not only expands “alternative” energy sources such as small nuclear reactors (SMRs), geothermal, hydro, and selected wind and solar but also embraces advanced thermal technologies for the use of coal and gas.

Coal’s most important uses include the following:

1. Power generation (more than35% of global electricity is generated from coal)
2. Industrial heat (for the production of glass, cement, and other products)
3. Steel production (2/3rds of the 2 billion tonnes of steel produced globally each year rely on coal)
4. Extraction of other raw materials through chemical reduction and related processes, such as silicon for computers and solar cells, as well as chromium, nickel, aluminium, and more (e.g., use of fly ash in cement production)
5. Residential heating
6. Source of critical minerals and fertilizers through humates

Coal offers four key advantages over other energy sources:

1. Typically, lowest system cost (i.e., low upfront investments and transportation or processing costs)
2. Minimal geopolitical risk, since coal reserves are relatively more evenly distributed worldwide, and both production and transport are difficult to control
3. Easy and safe transportation (no need for pipelines, LNG terminals, or regasification facilities)
4. Highest energy security, as coal is easy and simple to store with low risk outdoors (i.e., no dependence on pipelines, no storage tanks required, and no explosion hazard)

While many in Germany and across Europe may believe that coal is no longer needed, a broader global perspective quickly reveals this to be a misconception - even solar modules or wind turbines are still not possible without coal. Coal remains the most vital component of the global electricity supply and demand continues to grow. Although industrialised nations have rapidly expanded wind and solar energy under conditions of stagnant energy demand, many developing and emerging countries often still face the challenge of meeting fundamental energy needs.

Access to stable and continuous energy sources is often a challenge, which is why coal, as well as gas and nuclear power, are essential resources for providing continuous energy on an industrial scale and keeping the frequency in the grid stable (grid inertia, see Blackout Spain). Globally, coal is the most cost-effective and most easily accessible energy source, allowing countries to develop their economies and improve living standards. Coal is flexible, can ramp up and down quickly with demand requirements and has low security risk.

In a widely noted publication from May 2024, the ASEAN Centre for Energy (Assessment-of-the-Role-of-Coal-in-the-ASEAN-Energy-Transition-and-Coal-Phase-out) made it very clear that coal is and will remain indispensable as an energy source for the Asian economic region. A hasty coal phase-out would severely impact the economy and the population. This is because not only countries such as China, India, Indonesia, Pakistan, Vietnam, Bangladesh (40% of the global population) have an enormous hunger for energy that cannot be met by wind and solar alone. India, for example, plans to consume more than twice as much coal in 2025 as the US and EU combined.

Coal, as one of the most widely used energy sources in the world, is considered particularly reliable and secure. Estimates suggest that global known coal resources will last over 1000 years. This means that coal offers security of supply until a necessary 'new energy revolution' (see: "Inconvenient truths... about electricity and the energy of the future (The Unpopular Truth). Particularly emerging and developing countries in Asia that are aiming to establish an independent energy supply can often only meet their energy needs reliably and affordably through coal, oil and gas. The expansion of industry and infrastructure requires a stable energy supply. As a low-cost energy source, coal plays a key role in ensuring affordability, supporting economic development, and maintaining competitiveness.

Coal can be mined cost-efficiently and is available at low prices on the global market. Where considered appropriate, CO_2 capture technology is already available and can be employed. This makes coal attractive to many countries, particularly those with limited financial resources. As a result, coal is a critical factor in many countries, contributing not only to energy supply but also to economic stability. Global coal demand reached a new high in 2024. According to the International Energy Agency (IEA), nearly 9 billion tonnes of coal were consumed worldwide. IEA experts also expect that coal demand will r emain high in the years ahead.

Unlike solar and wind power, which are intermittent and weather-dependent, coal enables continuous on-site electricity generation. The importance of rotating mass and inertia in our modern power grids, which cannot be provided by inverter-based wind and solar, was exemplified by the Iberian blackout end April 2025. Power plants and industrial facilities can store the necessary coal and use it reliably—even in times of crises when the use of pipelines and power grids is not guaranteed.

In the years ahead, global electricity demand growth cannot be met by wind and solar, especially in countries experiencing above-average growth. Most countries also lack the conditions to fully cover their electricity needs with wind, solar, nuclear, and hydropower. Coal and gas must therefore help bridge this gap. Coal utilisation technology has steadily advanced in recent years. Low-emission technologies have significantly helped reduce the environmental impact of coal usage. Over the past

150 years, the plentiful electricity from coal and gas has contributed to an unprecedented reduction in poverty and a rise in life expectancy and health. This will continue to apply to the Asian region and other emerging economies in the coming decades.

Meanwhile, there is scientific evidence that coal and gas are roughly equal in terms of climate impact when viewed through the UN International Panel for Climate Change (IPCC) 20-year "global warming potential," which includes methane, and taking into account that more than half of the emitted CO_2 is absorbed by the biosphere and oceans (peer-reviewed sources are available (The Unpopular Truth: Natural Gas or Coal - Do we have a choice?). In many cases involving liquefied natural gas (LNG), coal may even have the "climate advantage" (The greenhouse gas footprint of liquefied natural gas (LNG) exported from the United States). Unfortunately, this is rarely acknowledged by European governments, which – like Germany – rely on imported LNG instead of domestic coal. Either way, the world needs all reliable forms of power generation, coal, gas, nuclear, hydro, biomass, and geothermal.