

Is this the age of the skunk?



We must seek solutions to problems that plague the world today without being limited by regulations and simplified perceptions that govern public debate, argues **Rutger Gyllenram***

"This was really bad news"

SHORTLY after my very first article in Steel Times International in 2021 (Between a pony and a pink unicorn? Steel Times International, October 2021) where I questioned the possibilities for a rapid

global transition to reduction of iron ore with hydrogen, I was invited to participate in a panel at the worldsteel Open Forum in Brussels. There, I expressed my view that the blast furnace will remain the dominant reduction process for a long time to come and received a strong reaction, "this was really bad news". It came from, among

others, a UN official working on a team to reduce methane emissions from coal mines and natural gas management. The reaction was not surprising since the solution that dominated the debate at the time, for both methane and carbon dioxide emissions, was to stop the extraction of fossil fuels, coal and natural gas, and replace the

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blast furnace with direct reduction using hydrogen from so-called green electricity.

A decade earlier however, one of the main proposals for decarbonisation was to develop the blast furnace with a combination of more efficient gas utilisation combined with carbon capture and storage (CCS) as proposed in the European ULCOS project. In 2022 these ideas had mostly been put aside, interest in CCS was limited and branded unfeasible and hydrogen was the magic word with many new projects planned.

Today the tone is more sombre and messages this spring at steel conferences like the worldsteel Open Forum ^[1], STI's Future Steel Forum ^[2], and Fastmarkets' International Iron Ore and Green Steel Forum ^[3] revealed that investments in near zero emission ironmaking has more or less come to a standstill and we hear voices that just a few years ago would have been considered heresy. A first example comes from an analyst claiming that with this pace in decarbonisation we will miss the goals set to meet the Paris agreement ^[1]. Statements from senior industrial leaders were that: "no one wants to pay more for green steel" ^[2] arguing that DRI from natural gas is as good as it gets at the moment and that green premiums are exceptions, and finally "Europe must protect competitiveness without giving away the value of early decarbonisation." "Leadership means keeping technological options open – not locking into one path" ^[3]. These are probably the most outspoken statements this spring.

But this is no surprise! The tragedy is that people with insights in the steel industry, companies, technology, markets, raw materials and development dynamics have understood this for a long time. What has happened now is that a cruel reality has called the cards. There is, however, no cause for alarm and I put my trust into the metaphor of an adorable animal using smell for protection. Let me explain.

The skunk concept

The term 'skunk project' has its roots in the aircraft industry during World War II (Lockheed) where a particular project was organised with a great deal of freedom to be innovative and work quickly. There are some excellent articles online, but for our purposes here, it is sufficient to note that the team in a 'skunk project' is allowed to

work in secret and without being guided by established rules and working methods. This proved to be crucial in the transition from designing propeller aircraft to jet aircraft where some of the previous design rules and inspection procedures no longer applied. By the way, the nickname 'Skunk works' came from the unpleasant odours emanating from the surroundings of the original premises, but since then the term has lived on for this way of getting results.

To move on from the depressing situation outlined above where we tend not to make real progress in reducing greenhouse gas emissions, policy makers and companies, in true skunk spirit, should give themselves some freedom of thought and get rid of what is preventing the industry from getting results. In the absence of a better word we can call these newborn disruptive thinkers 'skunks'.

Removing thought barriers

There are at least six major barriers to thought that cloud our judgment and prevent us from creating real change in the steel industry. Honestly, you could say that most of them are of that feel-good nature that aims to make us feel that we are in control, but that is an illusion. For the sake of discussion, my arguments may be a bit blunt, but this is my way of understanding what is happening.

1. Global control mechanisms: Ever since the Stockholm conference in 1968 the UN has played a paramount role in taking on global challenges not without success. Already at the beginning it became clear that environmental goals had to be combined with development goals which was covered in the following conferences in, for example, Rio and Doha. The Paris conference on climate set out goals in the same spirit and although they may be well motivated from a scientific perspective they did not take into account what countries actually can and want to live up to. A skunk

must, therefore, consider that the goals in the Paris agreement might be revised and set tough but achievable goals for the industry.

2. Regional control mechanisms:

The European Union has been a frontrunner in developing systems aimed at decreasing the GHG emissions with the ETS-system and later CBAM and far reaching research projects. Although otherwise successful, the EU has failed when it comes to reforming the steel industry. The projects developed within ULCOS did not reach maturity within the EU and some blast furnace plants have invested in DR plants using expensive Liquid Natural Gas (LNG) hoping for piped hydrogen at a reasonable price. Other blast furnace plants are ducking, waiting for a miracle, while the Commission is accused of deindustrialising Europe. What will happen in China with more powerful mechanisms to reform the industry is yet to be seen. A skunk must, therefore, consider that it is still early days when it comes to governmental control and focus on what can be achieved by the Best Available Technology (BAT) for the reductants that can be used in a sustainable manner.

3. Product ecology: Global warming potential (GWP), calculated in a bookkeeping life cycle assessment (LCA) programme often called carbon footprint, is today an accepted measure of the impact an individual project has on the climate. It is intended and useful for informed decisions on raw materials and design features. It is, however, a sub-optimisation and, therefore, lacks relevance outside the studied system. The most prominent example at the moment is using climate arguments to charge scrap in the blast furnace as a general method to reduce the carbon footprint for steel. There may be many good reasons for doing this, such as an increase of productivity or reducing production costs, but it has no effect on reducing greenhouse gas emissions globally. The extreme example is to use climate arguments for closing blast furnace plants and replacing them with scrap-charged EAFs. It makes perfect sense when a blast furnace plant reaches the end of its life cycle, but it is not an investment to reduce carbon emissions from a global perspective, other than new technology being more energy efficient than old. In the long run, the public debate on how to fulfill



the Paris Agreement will recognise that replacing ore-based production with scrap-based for climate reasons is not a credible position and makes the LCA approach questionable. A skunk might, therefore, abandon bookkeeping LCA for other metrics useful for GHG emission mitigation.

4. Circular economy: Recycled content, although popular among lawmakers, is a completely irrelevant concept for steel decarbonisation as all available steel scrap, at any given scrap price level, is currently used. The challenge, however, is to recover as much value as possible from a steel product, which is why the concept of recyclable value would have been more functional and could take into account material losses to slag, accumulation of tramp elements and possible utilisation of alloying elements. Probably this means a close co-operation between steelmakers, product producers and scrap processors. Iron and alloys that we do not lose to slag does not need to be reduced from ore, which saves emissions. A skunk must, therefore, focus on resource conservation and consider that recycled content in the long run will lose its attractiveness.

5. Resource availability: It is interesting to follow the debate about access to raw materials needed for the transition to low-emission production, where it is said that we want good access, high quality and low prices. This is nonsense since that combination does not exist for most, if not all, commodities in a market economy. You have to choose two out of three. Furthermore, ore beneficiation, if possible for the ore in question, and scrap upgrading both come with yield losses and a processing cost. The key to availability of high quality scrap is instead a stable quality premium that makes investments in processing feasible. And it is not black and white, an EAF can take a certain amount of high gangue DRI instead of scrap and there is a huge potential in decreasing tramp elements in scrap with better sorting. The availability concern probably emanates from efforts to do roadmaps for a rapid transition from blast furnaces to DR-EAF plants, but that scenario is irrelevant due to a limited amount of scrap at any given scrap price as stated earlier. The ultimate act of madness would be for an industrialised country to introduce an export ban on scrap for



climate reasons as it would probably keep the price down and decrease collection. In addition, it might force countries that focus on infrastructure and manufacture long products with lower requirements for tramp elements to build blast furnaces while the home market with an extensive industry requiring flat steel with high requirements, would face quality problems. And all this without any climate gain. Transformation takes time and companies will work as they have (almost) always done, starting by securing the raw material sourcing before construction. The skunk should, therefore, plan for flexible use of different qualities and prepare for the premiums on high-end raw materials.

6. Geopolitical assessment: When dealing with global warming it is easy to forget that the whole world is in constant transition in so many different ways. Global warming is just one issue and we do not know to what extent countries will live up to their commitments when they also have to tackle other concerns. Obstacles are the trade wars including subsidised overcapacity creating uncertainty, and hot wars that we, when this is written, do not know how and when they will end. Regardless, any trade imbalance with China must be solved in an orderly and collective manner and in a world where Russia and Iran have a long-term, sustainable peace with their neighbours, they have a lot to contribute in the form of access to skilled personnel, natural gas, and good ores. It seems hopeless now, but since all parties involved are needed to clean up the mess that has been created, we have to start somewhere and make sure that this time we get results. A good friend who served on a UN mission between North and South Korea used to say: "You should start with what you can agree on and deal with the disputes later." My battalion commander in the Balkans had another inspiring gem after we presented an operations plan with different action options for everything that

could go wrong: "It could also go well". One of the most important qualities of a good skunk is to sense the winds of change and understand when new opportunities open up and be prepared to act without anxiety about political correctness.

Smell of skunk - glimmers of hope

The stated tone in today's debate is not a sudden flash of insight from individual industry representatives, but rather indicates an analysis and development work that has been carried out outside the control of the usual opinion machine. When the UN Secretary-General comes out and advocates that the easiest way to curb GHG emissions is to reduce methane leakage from coal mines and natural gas sources, it is an intentional or unintentional recognition that we will also need fossil fuels in the future. Furthermore, the announcement that EASyMelt, which is a development at SMS of ULCOS's improved blast furnace process, will be deployed at Tata Steel in Jamshedpur is also a sign that the industry dares to think in impermissible ways and has done for some time. My friend John Lichtenstein [of World Steel Dynamics] pointed out in a conversation the other day that the Steel Standards Principles efforts of the WTO and worldsteel is another glimmer of hope. Whether it is a result from skunk project principles, I do not know but if we are to have meaningful discussions about decarbonisation, we need a functional rule-based system to rely on.

Finally, if, during the clear autumn evenings that await us, you become aware of a faint odour, be sure that it is the unpleasant smell of realism replacing the seductive fragrance of wishful thinking. Enjoy! ■

Read also:

- Global steel industry decarbonisation: A luta continua, Progress report and forecast, John Lichtenstein World Steel Dynamics, Excerpts from Open Forum June 2026, available at worldsteel.org
- Time to sober up! Steel Times International, October 2025
- Blast furnaces ain't going nowhere! Steel Times International, October 2024

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