DECARBONISATION OF TSUK

SUMMARY OF SYNDEX ANALYSIS

16TH APRIL 2024

NON CONFIDENTIAL VERSION

Contents

Glossary

MU : Multi Union

HSM : Hot Strip Mill

HDG : Hot Dip Galvanised

HRP: Hot Rolled Pickled

CRC : Cold Rolled Coild

EBITDA: Earning Before Interests Tax Depreciation and Amortisation

SAF : Submerged Arc Furnace

OSBF : Open Slag Bath Furnace

OBM : Ore Based Metallics

DRI : Direct Reduced Iron

NG : Natural Gas

H2 : Hydrogen

CAPEX : Capital Expenditure

A financially driven decision

The proposal to shut down the heavy-end of Port Talbot and to replace it with a 320t EAF concludes a long list of decarbonisation scenarios considered by TSUK since 2020. This project, named Invictus, has replaced the previous preferred scenario, Cronus, which was based on two 160t EAFs and a thin caster.

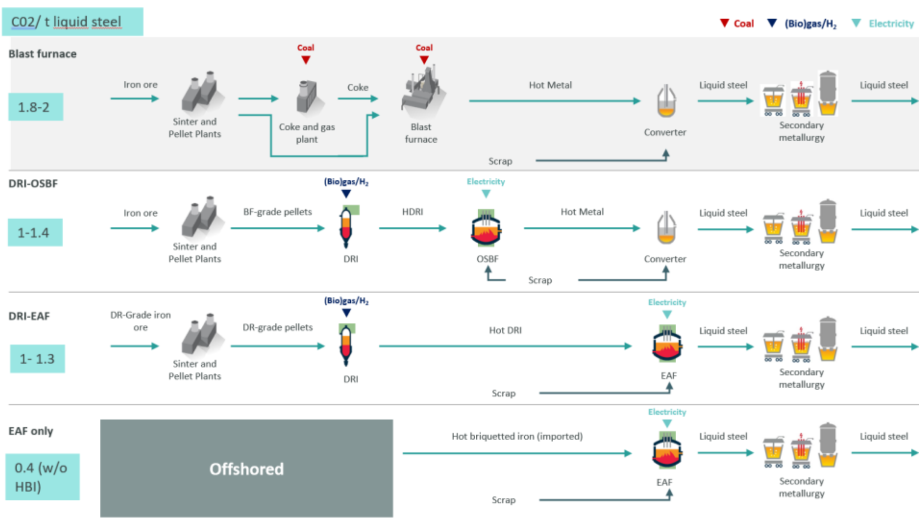
Cronus had a lot of advantages and notably it allowed a smooth transition by sequentially replacing the two BFs without interfering with the steel plant. Our main concern at that time was the impact on the portfolio. Most of the packaging products, not only the DWI, but also a significant part of the portfolio relating to automotives and tubes, would no longer have been deliverable. This would have been a consequence of the switch to a thin caster technology. Syndex had proposed to maintain the Hot Strip Mill after the closure of the BF4 in 2032, fed with external substrates in order to maintain the full range of production. The additional volume would have required additional downstream after 2032 and a business case for new capacity in HDG, NOES and plate had then been thought of as potential avenues.

After more than a year of discussion, Cronus was shelved for financial reasons. The decision to build a 3mt EAF and to keep the HSM is mainly financially driven. It is a far cheaper solution but on all other aspects, Cronus + HSM would have been a far better option.

Context: ongoing rush to decarbonise European flat steel production, but the path chosen by TSUK is highly uncommon

Tougher environmental regulations and the increasingly high cost of carbon are rapidly pushing European steelmakers to decarbonise by replacing blast furnaces with electric steelmaking capabilities. While decarbonisation ultimately means the same goal for all actors involved (reducing steelmaking carbon emissions to the minimum allowed by current regulation by employing electricity and, at a later date, green hydrogen to replace fossil fuels), there is no single technological choice: EAF only, DRI-EAF or DRI-OSBF are all routes ultimately resulting in the same overall reduction in emissions, but with considerably different strategic (market, financial, operational etc.) implications. Figure 1 gives a brief overview of these choices. It is worth highlighting that the TSUK management has opted, through project Invictus, for the last option for Port Talbot: EAF without a captive DRI.

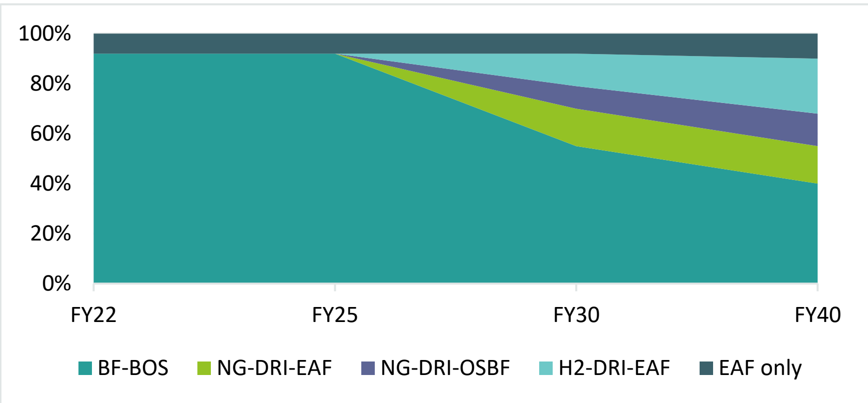
Figure 1. Technological choices available for decarbonisation



If project Invictus materialises in its current state, TSUK will be the only major European flat steel producer decarbonising with an EAF-only route. TSUK will also be the only European major flat steel producer who shuts down all its blast furnace capabilities early on, giving up on significant parts of its current portfolio and fully and immediately exposing itself to the potential risks involved in decarbonisation (more on this below). Indeed, as shown in table 1, not only do all significant competitors go for DRI-EAF or DRI-OSBF solutions, but all are maintaining significant blast furnace capacity until 2030 and most plan to maintain BFs well beyond that. TSN will not be an exception from this general rule. This is undoubtedly a way to ensure a proper learning curve while giving enough time to set up supply chains and reach technological maturity.

With a simple EAF of 3mt (in fact 2.5mt of finished steel) TSUK will have a unique set up, similar only to Arvedi in Italy, which has recently announced a switch to 100% scrap feed. All the other players in Europe will have at least one blast furnace until the end of the 2030's, and most of them into the 2040's. Only SSAB will have no blast furnaces at the beginning of the next decade, but they will produce hydrogen green steel by 2026. Arvedi is a major producer, but its flat steel products range are still far from the quality of the best players in the industry. Moreover, Arvedi is rumoured to be interested in acquiring Acciaierie d'Italia, one of the biggest integrated plants in Europe. If this happens, TSUK will therefore be the only flat steel producer without a blast furnace in Europe.

Figure 2. Eu flat steel capacity – forecast



Source: Syndex

Table 1. European steelmakers' decarbonisation pathways

Company	Location	Project	Timeline	January 2024 progress
ArcelorMittal	Gent, Belgium	€1.1Bn project for 2.5Mt DRI plant and two EAFs,	DRI plant operational from 2030	BFs to run up to 2030
	Hamburg, Germany	Investment of the €110M DRI plant, out of which €55m funded by the Government DRI plant producing 100,000 t/y DRI-EAF plant to switch from from natural gas to hydrogen	DRI plant operational from ~2025	No BF
	Bremen/Eisenhüttenstadt, Germany	DRI plant (3.15Mt/y) and EAF Investment ~€1-1.5Bn Using hydrogen from electrolysis	DRI plant operational from 2030	DRI operational by 2026
	Dunkirk, France	€1.7Bn investment by 2030 in the two sites, aiming to reduce 40% or 7.8 Mt/y	Operational from ~2027, gradually replacing 2 BF out of 3 units in Dunkirk, and 1 BF out of 2 in Fos	2 EAF in Dunkirk replacing 1 operational BF (2.5MT). The second BF (2.5MT) to remain operational for now.
	Fos-sur-Mer, France	Dunkirk: DRI (~2.5Mt) and EAF		By 2030, ArcelorMittal aims to replace 3 out of 5 BFs in France (2 out of 3 in Dunkirk and 1 out of 2 in Fos).
		DRI produced by using hydrogen instead of coal		
		Fos-sur-Mer: BF → EAF		
	Gijon/Sestao, Spain	Green hydrogen DRI and hybrid EAF	DR plant 2.3MT and hybrid EAF 1.1Mt operational from 2025	1 BF will remain online for flat products. EAF to be for long products, replacing the second BF. Combined 2 BF current capacity at 4.7MT.
LKAB	Kiruna and Malmberget, Sweden	DRI plant using hydrogen probably from electrolysis	First plant operational in 2029 in Malmberget	N/A
Liberty	Galati, Romania	DRI plant (2.5Mt) and two EAFs	EAF by 2030, DRI plant installed 2023-2025	2030 deadline for BF replacement.
	Ostrava, Czechia	Replace four tandem furnaces with two hybrid furnaces	Installed by 2023	
Salzgitter AG	Germany	DRI plant 1.5Mt/y	Operational from ~2025	2033 for full scale operation. 1 large BF replaced by end of 2025. 1 small BF replaced by end of 2030. 2nd large BF running until end of 2033
Ascoval	France	DRI plant (2Mt/y)	By 2030	
Voestalpine	Linz and Donawitz, Austria	Converting BFs to EAFs, two at Linz site and one at Donawitz site . DRI in Texas	By 2030	6.5MT BF capacity (5 BFs in total). First BFs to be replaced by EAFs starting 2027. Rest of BFs to be replaced after 2030.
Thyssenkrupp	Duisburg, Germany	DRI - SAF	Operational from 2030	SoP in 2026. 2.5MT. Nominal capacity of 13MT
HYBRIT (SSAB, LKAB and Vattenfall)	LKAB Malmberget Luleå	Collaboration between SSAB, LKAB and Vattenfall. Production of fossil-free DRI	In 2026 fossil-free steel on market In 2025 transformation of BF to EAF at SSAB Oxelösund In ~2030 converting BFs to minimills with EAFs at SSAB Raahe and SSAB Luleå	N/A
Other integrated plants maintaining BFs operational with no concrete alternatives announced				
ArcelorMittal	Katowice, Poland	Nothing announced. 2 BFs, 4.5MT capacity. Modernization of BF2 announced in 2023.		
ArcelorMittal	Taranto, Italy	No concrete announcement so far, 11MT nominal capacity		
US Steel	Kosice, Slovakia	Nothing announced, 3 BFs, 5MT capacity		
HKM	Duisburg	Nothing announced, 2 BFs, 6MT		

Source: Syndex.

In short, although tightening regulation is making the decarbonisation of European flat steelmaking unavoidable, very few steelmakers will be fully decarbonised this decade and most of TSUK's major competitors will maintain some BF operations online until at least the beginning of the 2030s. Moreover, none have adopted an EAF-only route and, as Figure 2 exemplifies, European flat steelmaking is expected to only partially migrate to decarbonised solutions that mean primarily DRI-EAF and DRI-OSBF. TSUK will be a significant outlier in the future European steel landscape.

EAFs are not new. In fact, they have been part of the steel industry for decades, most notably in the production of long products such as sections and rebars. These are products where the lower grades of steel produced are compatible with the level of impurity of the steel typically made through an EAF.

Over the last 20 years, EAFs have played a greater role in flat products, such as the sheets used in the automotive sector. Such production has been most notable in the US industry. A new generation of mini-mills with medium size EAFs (1-2mt) directly feeding steel into a thin caster and continually producing hot roll coils has been a key development.

The mini mills which predominate in US EAF production are usually highly automated and have very low level of employment (600-800 employees for 3mt of Hot rolled coil).

EAFs will play a bigger role in the future. But here is the reality: simple EAFs will account for only a small fraction of the production of flat steel in the decades to come.

A 3mt EAF is not a mainstream choice for flat producers …

Most of the EAFs in operation today are in the range of 1mt-2.5mt. There are a very limited number of 3mt EAFs in the world and only one in Europe (Averdi), with only one other similar project to TSUK announced to date: Tata Steel in the Netherlands (but TSN will still have a blast furnace until 2040-45).

These big EAFs are mainly fed with scrap and there is still a lot of uncertainties around their level of stability and the capacity to produce steel with high HBI content. If, in the future, TSUK wants to increase the level of HBI above 60%, it may face technological issues. Indeed, there is no existing example of a 3mt EAF with at least 60% HBI. This is not a technology proven at this scale.

All the projects announced to date with the aim of producing at least 3mt of EAF steel are based on at least 2 EAFs. This is the case in ArcelorMittal in Dunkirk and Voestalpine but also Big River Steel in Osceola, Arkansas, with 2x1.5mt EAFs, or Nucor's last mega investment in Virginia (2x1.5mt EAFs).

To quote Big River the point "is not to build bigger but better". Indeed, smaller EAFs are more productive and more versatile. A 3mt EAF fed with 70% HBI would produce only 2.6mt of liquid steel and not close to 3mt like the smaller EAFs. The only reason why some have opted for bigger EAFs is for the lower investment up-front. Two small EAF's are surely a better solution than a big EAF but this comes at an additional cost of 40-50%.

In the case of the UK, two smaller EAFs, or a 1.5mt EAF and a 1.5-2mt smelter, in the future were also the only set-ups where a blast furnace could have been maintained.

With Port Talbot capacity being limited to 3.4mt of liquid steel (Hot Strip Mill) and the BOS plant limited to 3.8mt, a 3mt EAF means the end of the blast furnaces.

A 3mt EAF is the biggest size available, but it will be too big (2.7mt of liquid steel) to maintain the 2mt production from BF4 until 2032. The 3mt EAF would produce around 2.5mt hot rolled coils and this will not be enough to maintain the current volume impacting not only the heavy end from 2024 but also the downstream operation.

A solution that is a direct threat to the BF4 and will result in more than 2800 jobs losses.

Increasing steel production is a genuine ambition. Giving priority to UK steel in public procurement is the first step. The last public procurement analysis published in March 2024 concludes that 8mt of steel will be needed over the next 10 years. Unfortunately for TSUK, most of the steel required will be long products (rebars, sections, rails…), sheet-piles, large pipes and heavy plates. If public procurement were to be improved, the volume of steel that TSUK would be able to produce that is not already sourced locally would be very limited. On the other hand, flat steel imports are significant with HDG and plates being the main type of flat steel imported. Targeting the substitution of imports could deliver the largest opportunity. In some cases, like for plates, procurement and imports are somewhat linked but the largest part of the volume imported are bought by the private sector. This is the case for HDG products. The need to increase UK HDG production has been a point of discussion since 2016 with the CAPL to Galv project. If some of the HDG volumes imported are sold to the automotive sector, a major part is for general sales. Since 2017, the CRC-HDG spread has been extremely thin and this is a challenge for any new HDG investment. The MU plan has proposed to reopen the discussion on the HDG capabilities but also to analyse the business case for a plate mill which would complete the UK offer (Spartan and Dazell). The proposal to develop a NOES capability in the UK is another possibility.

The idea would be first to develop downstream facilities allowing an enhancement of the profitability of the tail of the portfolio notably some HRD and CR. 200kt of finished products maintained in the MU plan, are not covering their variable costs and 200kt are not always delivering a positive net margin. Generating more added value for these volumes is a priority. The proposal to consolidate the cold mills and the pickles lines is not in the scope of this consultation but in our view, it should be shelved. This project is a significant threat for Llanwern but beyond this is might not be the optimal investment. The decrease in volume of the current proposal is not aligned with the local procurement and substitution of import strategy supposedly promoted by the UK government. The consolidation of the downstream is also the result of the decrease of the steel output post 2028 if TSUK build a 3mt EAF. With the current set up, the volume produced will fall from 3mt to 2.5mt of finished steel.

In order to keep the BF4 open once the 3mt EAF is in operation, TSUK would have to dramatically change its profile. With the current assets, this is not possible. TSUK will have to invest in the BOS plant, the casters and a new hot strip mill but also in 1.4 - 1.7mt of new downstream capabilities (depending on the use of the BF4 Hot Metal in the EAF). A 3mt EAF and the BF4 would produce 4.7mt of liquid steel. This is not currently manageable through the BOS plant (3.8mt)[1], the HSM (3.2/3.4mt) but also the downstream which with 3mt would 100% loaded (at the exception of the CAPL). As mentioned above, 400kt are not profitable. Increasing the HSM capacity will not be sufficient.

The reference to the production level of 2015 is misleading. The UK demand has since decreased by 20% but more importantly TSUK has not only closed the HSM in Llanwern but also the line 5 in Shotton and Cogent. TSUK has also sold Speciality Steel and the plate mill in Dazell but also Firsteel, and other downstream assets. In order to have a viable business case TSUK would need to invest in new downstream assets for at least 1mt, with the very optimistic assumption that Tata would manage to sell another 400kt of HRP/CR products (reaching 100% market share in the UK). Llanwern would surely be a perfect location but in order to be viable the new HSM would need at least 1-1.3mt. This would also need immediate additional upstream and downstream investment but also an investment in a new EAF capability which would then replace the blast furnace after 2032. In order to maintain the volume of 2028-2032, TSUK would need to invest in a new EAF/OSBF of at least 1.6mt (if 600 kt of pig iron from the BF4 is used in 2028-2032). This is indeed a full new facility of 1.55mt finished steel and would require c. £1.8/2bn CAPEX above the £1.8bn investment required for the 3mt EAF and the additional costs to maintain the BF4 opened. The total CAPEX would be between £3.6bn and £3.8bn for 4.1mt of finished steel. At c. £920/t of finished steel this remains cheaper than a greenfield investment but represents an increase of £1.8 to £2bn compared to the MU plan or 64% per tonne of finished steel.

[1] The converter is a first bottleneck, but the casters are also a constraint due to make capability resulting from the portfolio requirement.

There is no doubt that an increase of the volume of TSUK should be part of the long-term strategy. Nevertheless, an increase in targeted produced volume will first require an in-depth analysis of the current capabilities and long-term demand.

There is therefore little chance that TSUK would have the required HSM and downstream facilities to support the flow from the BF4 and the 3mt EAF by 2028. There is a high probability (almost a certainty) that the erection of the 3mt will result in the closure of the heavy end and of part of the downstream with an impact on 2800 direct employees.

There is no business case for a DRI with the current proposal.

The UK will need to embrace the DRI – hydrogen route (see below) but the current proposal weakens the business case for a DRI plant. Indeed, the mix proposed would require only 5% HBI, c. 135kt per year. This volume will be too small for a captive solution, and it will also surely be too small to create the momentum for shared DRI plant in the UK. Indeed, a shared DRI plant located in the UK would have to be big enough to compensate for the high cost of energy by some economies of scale and remain competitive with an offshore DRI. A DRI on site would compensate for the higher costs of production by savings on energy resulting from the hot connect. Nevertheless, a DRI below 2mt would be too small to be a viable solution. As a result, without a SAF/OSBF solution, or a higher Ore Based Metal in the mix for the EAF, the business case for a DRI plant is too weak to be sure that the UK will one day again be a place where virgin steel is produced. The impact on the jobs will be limited (150-300 roles maximum) but the impact on the long-term sustainability (see below) and the portfolio addressable are significant.

Risk assessment of TSUK preferred choice

Portfolio

90% of steel grades could be made via an EAF, but in the case of flat products the range not addressable by an EAF is still significant and concerns some of the most profitable products.

The main constraint to produce more complex steel grades comes mainly from the raw materials used in the EAF process and the casting method. Producing a wide range of steel products through an EAF requires a very high content of ore-based metals (OBM).

EU Flat steel producers have announced a ratio OBM/scrap up to 70%/30%. This is the content of scrap ratio also achievable by most of the European blast furnaces. Even with such a level of OBM, the production of some more advanced grades of flat steel is not possible through an EAF.

This is the case, for example, for the DWI packaging, some automotive outer panels, and some steel grades for tube. The lower the content of OBM, the higher the range of flat which cannot be produced through an EAF.

EAF technology is progressing, and it is conceivable that the chemistry of a blast furnace will be replicable in an EAF in the future. However, a high content of iron ore and not just scrap, even so-called clean scrap, will be required. The local supply chain for raw material (scrap) will be limited to commodity steel as iron ore will still be massively imported.

In order to optimise the productivity of the EAF, and the quality of steel produced, the HBI/DRI for an EAF requires the input of DR-Grade pellets in the DRI plant. DR-Grade pellets are produced with high ferrous content iron ore. Only 3% of the global reserves of iron ore are suitable for DR-Pellet. There is almost no global market for DR-Pellets.

The premium for DR-Grade pellets vs BF-Pellet (traditional blast furnaces) will increase in the future as the demand/supply imbalance grows significantly.

The lack of available supply for DR pellets is the main reason why some producers without any easy access to DR grade pellets have opted for a DRI-smelter solution which allows them to use BF pellets instead of DR-grade pellets in their DRI plant.

This is the case for ThyssenKrupp and Posco, but also Tata Steel in the Netherlands who intend to develop a DRI-Smelter in the future. As a matter of fact, an EAF in the UK could benefit from the local supply of scrap but will have to source DR-grade pellets for a DRI or high ferrous content iron ore if the UK develops a pelletisation capability, potentially facing more supply issues and costs than with the current raw material supply.

Supply chain

The closure of the blast furnaces and the installation of a large EAF means TSUK will have to buy slab and coil in significant volumes.

The management's proposal involves sourcing slab and/or hot rolled coil to compensate for the early closure of the BFs (June-September 2024) and until the EAF is installed (end of 2027). This is logical, since any scenario that involves a transition period without steelmaking capabilities (BFs closed before EAF comes online) requires large volumes of slab and coil from external suppliers.

Once the 3MT EAF is installed, steelmaking capabilities in Port Talbot will still not be sufficient. Any scenario that involves one EAF only will require future permanent sourcing of slab and coil to maintain volume and portfolio. TSUK will reduce the volume to 2.9mt deliveries and will need around 400kt of external HRC.

The key question is who will supply the slabs and coil, especially during the transition period, when large volumes are required. TSUK is currently discussing with several suppliers in and outside Europe to supply the above volumes. Some of the slab/coil can be sourced within the group (from TSN or India), but it is very unlikely this can happen in sufficient volume.

An assessment of these options shows that TSUK will very likely face significant difficulties in souring slab and coil, notably in Europe.

Generally, the European market for slabs (and hot rolled coils) will become increasingly tight as decarbonisation projects kick in and blast furnace capacities are taken offline. Steelmakers will be even more incentivized to prioritize slab/coil supply for their downstream capabilities (they will be under similar pressures as TSUK). Even TSN, according to the press, will have to import slabs from 2028/2029.

The situation might look favourable today (low market prices for finished products and low HRC spreads), but this is unlikely to persist in the following years.

Outside Europe, the situation is likewise complicated:

- Sourcing of slab and coil from Tata Steel India is likely feasible (intra-company agreement), especially given the significant capacity expansion (+5MT in Kalinganagar) expected to fully come online this year.
- Historically, Russia and Ukraine supplied slab to Europe, but this is out of the question for the foreseeable future.

- Sourcing from Vietnam is also likely feasible, as the Vietnamese steel industry has proved ready to fill the gap left by Russia/Ukraine.
- Brazil sourcing might prove complicated, especially in large volumes, as Brazil has historically exported to North America.

All these suppliers will be subject to CBAM (starting with 2026 in the EU and 2027 in the UK), which means a higher cost base.

When considering all of these together, it can be assumed that TSUK could be able to source 1.3-1.5MT of slab and 1MT of coil. The rest could prove difficult either from an availability or from a cost point of view. This means there is significant risk to volume and portfolio especially during the transition (2024-2027).

On top of the risks related to the supply of slab and coil, there are significant issues when it comes to sourcing scrap and DRI/HBI and the solutions currently explored by the management are far from certain. Future scrap supply will depend on price competitiveness on an increasingly tight market; in other words, despite the UK being a major scrap producer and exporter, there is no guaranteed “home advantage” for TSUK when it comes to scrap supply. Moreover, TSUK will require important quantities of high-quality scrap that are currently not available and that will require the development of scrap sorting and shredding capabilities. These require significant investments (either from TSUK or from its suppliers), which means nothing is certain until these investments materialize — no concrete progress is visible in this regard as of yet.

When it comes to HBI (hot briquetted iron), sourcing opportunities are being explored by the company, but it remains a big unknown. The lack of a captive DRI means that TSUK will have to source DRI/HBI from the UK or HBI most likely from outside Europe. Sourcing HBI elsewhere in Europe will prove challenging, as most planned capacities will be captive. Outside Europe, TSUK will likely attempt to identify a supply of HBI in the Middle East. This as well is just on paper for now.

Overall, there are significant uncertainties regarding the supply of slab, coil, scrap and HBI. The materialization of these risks during the transition could lead to a substantial loss of volume and significant underutilization of downstream assets for a prolonged period. In the future steady state, the lack of a high-quality scrap supply and insufficient HBI volumes could lead to a loss of the most valued parts of the TSUK portfolio and increased vulnerability to commodity steel market volatility.

Note that any scenario in which the BFs are closed immediately involves transition-specific supply chain risks (due to the need to import large volumes of slab and coil) that are very difficult to go around. These risks can only be avoided by maintaining BF capabilities. Following this, the steady state supply risks (scrap and HBI, notably) could be mitigated by: 1) a captive DRI fully meeting the need for metallics; 2) investment in captive scrap sorting and shredding capabilities; 3) opting for different technological choices (2 EAF or EAF+OSFB).

Maintaining the BF4 and an EAF

Building an EAF while the BF4 in operation is complex, but possible. TSUK have commissioned several engineering reports. Two concerned the 3mt EAF. The first was published in July 2023, the second in January 2024. One report focuses more in detail on the challenges of the development of the 2x160t EAF. It has been prepared in November 2023. In relation to the 3mt EAF, the first report concludes that:

> "The *specific location of the new furnace in the BOS Plant does not change if the plant is operating or mothballed. It is in the optimum layout position for access to electrical utilities, scrap feed, and access to the existing casters. (..)If the BOS Plant, where the new assets are to be located, is operational during the build phase, the new assets are (…) well positioned to minimise disruption to current operations. However, the use of existing overhead cranes during the erection of the furnace and its auxiliaries, needs to be checked during detailed planning in consultation with the erection contractor and BOS Plant operations personnel. Where necessary mobile cranes can be used for construction*".

The new report states that

> "*The feasibility study in July 2023, to check the possibility of installation of a new 320 T EAF in the space available towards the southern side of charging bay of BOS plant assumed that the existing BOS plant operations shall be stopped once the EAF came into operation; risks were listed in terms of potential delays to startup and increase in cost, but not quantified at that stage*".

It is true that risks were listed but there were clearly two options analysed, one with the BOS in operation and one with the BOS mothballed.

The January 2024 feasibility study recommends the closure of the heavy end by March 2025 on the basis of safety issues (notably for constructions workers) and the optimisation of the time required for the construction of the EAF and auxiliaries. The January report does not conclude that building the 3mt EAF is not feasible but that "*considering safety issues, additional cost (for only a few years of operation of Converter) and additional time required for commissioning of EAF, it is recommended to stop Converter as well as related heavy end.*".

Maintaining the BF4 in operation would come with an additional cost of £238m[2] including impact on the profitability of the BOS and for the change of scope and additional investment. Most of the additional investment for the change of scope is also needed for the 0BF scenario. These are additional costs to the first estimates of the CAPEX of the 0BF scenario and are not related to the extension of the BF4 operation. The additional cost related to the change in scope for the construction of the 3mt EAF if the BOS is not mothballed is in fact less than £20m.

There is no doubt that from an engineering point of view a solution exists to build the EAF while the BOS is in operation. The safety concerns must be taken seriously. It is nevertheless addressed by the analysis and the main reason for the timeline extension and the negative impact on the BOS level of production. The main argument resides in the limited life extension (2 years maximum) of the BF4. The BF4 would have to close in 2028, in any scenario based on a 3mt EAF.

A separated report assesses the feasibility of the 2x160t EAF with one 1.5Mt EAF (160t), with two 160t ladle furnaces, producing 1.5Mt through Caster 1, commissioned in 2028 and the commissioning of a second EAF, or an OSBF, of 1.6 to 2 Mt and shutdown of BF4 by 2032. This report relates clearly to the Multi-Union Plan. As mentioned by this report,

[2] All figures include 15% contingency. The costs of the Capex for the 3mt EAF/0BF in the January report is kept at £932m by reducing the contingency budget from 30% (November 2023) to 15% as the CAPEX is deemed more complete.

"The major challenge is to fit the second 160 T EAF in the BOS plant in Phase-2. i.e., after 2028 (…) Available space between the first EAF and existing BOFs is inadequate for locating second EAF along with its shell maintenance facilities. (…) it would not be possible to accommodate 2X160 T EAF in the BOS plant without affecting the production and closure of the Sinter plant, BF-4 and its related auxiliaries. (…) In order to overcome the above constraints, a solution has been found that places the first 160t EAF in the BOS plant and the second 160 T EAF towards south side of BOS plant by extending the building.".

The feasibility study estimates the Capex for this solution at £1.65bn[3] this includes all the equipment's and related auxiliaries but also the "additional *cost for extending the BOS plant buildings towards the southern side, filling up of Lagoon* (…)". This report has been completed at the same time than the second feasibility report on the 3mt EAF.

One of the solutions not envisaged is the construction of the first EAF on lagoon extension instead of within the BOS plant.

The Multi-Union plan's main challenge will surely be the optimisation of the flow through the casters. Some products might not be deliverable, like the wide IF steel for Automotive. CC3 is limited in width. If CC1 is reserved to the EAF, some non-capable EAF products of large width will not be deliverable anymore. These products are nevertheless condemned by the EAF only solution. The limitations of the MU plan are nevertheless lower than the EAF only solution. Furthermore, the business plan of TSUK is based on the CC2 being mothballed. Keeping the CC2 opened would allow to optimise the flow but also to develop an additional offer for downstream and notably a plate mill.

Capex to maintain the BF4 opened until 2032: £622m (with 30% contingency included)

TSUK estimates the Heavy end CAPEX required to maintain the BF4 opened at £534m between 2025 and 2032. In our view this figure is over estimated and would represent a very high level compared to the level of CAPEX of the last 10 years. In our analysis the CAPEX required to allow the extension of the BF4 until 2032 is of the order of $367m. This figure excludes the investment in the ESP gas filters, pending a confirmation of the position of the Welsh Government in relation to the extension of the derogation granted until 2024. It also excludes some structural investments that would have been necessary in any case (notably £50m for the roof of the steel plant). Some investments are also already included in the estimated £1650 million CAPEX for the 2x160T EAF (new teeming and turret crane and removal of old cranes). The additional CAPEX for the BF4 operation until 2032, once factored the investment altready accounted in the the CAPEX for the 2x1.5mt EAF, is therefore of the order of £252m.

The total CAPEX for the next 10 years in the 0BF model, including the downstream is £1,745m with £932m for the EAF. The additional CAPEX to maintain the BF4 open represents an increase of 14%. The Multi Union Plan does not include a consolidation of the cold mills and pickle lines. Sustaining CAPEX for the cold mill in Llanwern, the pickle lines and the CAPL over the period is estimated by Syndex to be of £32m. When all these elements are factored in, the MU plan would require only £52m additional compared to the 0BF scenario in order to maintain the BF4 and all the current assets in operation until 2032. The additional CAPEX for the 2x160t EAF including all the additional costs mentioned in the engineering report is estimated at £1.45bn with 15% contingency, i.e. £519m above the estimate for the 3mt EAF with 15% contingency as referred to in the last engineering report.

[3] With 30% contingency ie £1.45bn with 15% contingency.

The total additional CAPEX for the MU plan is therefore £551m with 15% contingency or £622m with 30% contingency above the CAPEX of the 0BF solution. The additional CAPEX represents an increase of 31% compared to the total CAPEX plan over the period for the 0BF scenario (heavy end and downstream) but only 10% in terms of CAPEX per tonne of finished steel.

The Multi-Union Plan delivers a positive EBITDA over the period FY26-FY32

One of the redlines of any alternative considered was to address the EBITDA loss and rebuild a sustainable financial profile. The MU plan would deliver a positive EBITDA between April 2025 and March 2032. This is the case in Syndex estimates but also in the conclusions of the management.

The management's model concludes that the BF4+1x160t EAF would deliver £255m EBITDA over the period[4] before additional negative impacts and still £16m when these elements are taken into account. TSUK's estimate is based on a lower volume of deliveries (3mt) than the MU plan (3.3mt) with a consolidation of the cold mills and pickle. It considers also that the majority of the green premium would not be captured. The Syndex model is based around additional volumes in order to maintain all the assets. With all the volumes of the 2BF portfolio and all the assets maintained the EBITDA for the period would be £172m.

The profitability can further be improved by the use of more scrap directly in the blast furnace to compensate for the lower charges at the BOS level due to the layout of the steel plant after the erection of the EAF. Additionally, if the first EAF is built on the lagoon, this might not be a problem. A solution to these issues would deliver an additional £87m. The lower productivity of the BOS during the phase of the construction of the EAF is due to required operational stoppages to allow for the construction itself.

Based on the company estimates, the EBITDA gap between the MU plan and the 0BF model (FY26-FY32) would be £1,182m in favour of the 0BF solution. In our estimate the gap would be £1,025m if all the assets are maintained and £889m if the non-contributive additional volume was removed (purely loss-making tonnages).

The MU plan is therefore EBITDA positive over the period and fully sustainable by FY32 (£200m EBITDA) but will never deliver the potential return of the 0BF solution.

The gap between the 0BF and the MU plan is nevertheless highly dependent on the price of CO2 credits. The model is based on a significant increase of the costs of CO2 credits. This might not be the case. The current price in the market of the UK allowances is £34.6 per tonne. At that price the profitability of the MU in FY32 would be above the profitability of the 0BF solution, respectively.

The Multi-Union Plan will reduce carbon emissions.

The Multi-Union plan will result in significant reductions in carbon emissions from their current levels. Currently Port Talbot is emitting six million tons of CO_2 per year, with downstream operations emitting a further 320 thousand tons. Under the multi-union plan the emissions from Port Talbot would fall to 3.45 million tons of CO_2 per year during the pre-EAF transition phase (until the 1.5Mt EAF is operational in FY2028). When both BF4 and the EAF are operational, direct emissions at Port Talbot will rise by 180 thousand tons to 3.63 million tons of CO_2 per year (in Port Talbot between FY2028-FY2032). The downstream operations would

[4] The period of reference is FY26-FY32 (April 2025-March 2032), FY25 losses are not factored.

have CO_2 emissions of 338 thousand tons per year throughout both periods. The total decline in emissions of between 2.53-2.35 million tons of CO_2 per year represents a cut of 37-40% in TSUK's total emissions, or to put it another way 0.8% of all CO_2 emissions from the entire United Kingdom. The emissions in the post 2032 period will depend on the nature of the asset chosen to replace the final blast furnace but will regardless bring a further decline in carbon emissions.

Tata's plan involves significantly more imports of steel slab than the multi-union plan. This results in less direct emissions in the UK, but it may increase global emissions. Currently Tata Steel UK can produce slab at 2.05 tons of CO_2 per ton. Many of Tata's potential sources of slab have worse emissions profiles, for example Tata Steel India emits 2.38 tons of CO_2 per ton of slab, while average blast furnace operations worldwide emit 2.2 tons of CO_2 per ton of slab. Assuming that these slabs would not otherwise be produced, importing them at up to 2.38 tons of CO_2 per ton of slab is worse in terms of emissions than producing locally at 2.05 tons per ton of slab.

When both BF4 and the EAF are operational, the Multi-Union plan allows for 1.2-1.3 million tons of scrap to be used per year. This is a scrap ratio of 35-39% of liquid steel production. This will be well above the industry average as long as blast furnaces continue to represent the majority of production which, by current estimates, will be the case well into the 2030's.

The Multi Union plan protects jobs and allows a just transition

The initial proposal of TSUK to replace the two blast furnaces with a 3mt EAF will decimate the headcount of SPUK and Llanwern. The MU plan acknowledges the decision to close the BF5 but proposes to maintain all the other assets as well as the volume of reference of the 2BF. In this scenario, between 250 and 320 operational jobs are at risk before 2028. The multi union plan could protect more 90% of the jobs at risk.

In the period FY28-FY32, with the increase in headcount required for the 1.5mt EAF and the increase in output of the HSM to 3.2mt, Multi Union plan would maintain a level of operational employment above the 2BF scenario.

The operational headcount after 2032 will be dependent on the technological choice and the final decision in relation to downstream assets. In the case of the decision to build a second 1.5mt EAF, the closure of the BF4+Sinter+Ore terminal will result in a net loss of c. 220 positions (with 150 positions for the operation of the second EAF). In the case of an OSBF, the ore terminal would surely be maintained, and a DRI would have to be built. The net impact of the closure of the BF4 could be marginal.

The main risk is at the functions and support level (engineering, energy, logistics, ….). These are the jobs that will need the more support to be redeployed. Most of them could be transferred to the construction activities but also to other activities that could be initiated in Port Talbot during the next decades, whether it is within TSUK (new capacities/capabilities) or outside. Most of these jobs have highly transferable skills.

Post 2032, the impact of the technological choice will only be mitigated by new capacities. The discussion over the future assets footprint should treat the employment and the impact on the local community as a priority. From this point of view, the consolidation of the cold mills and pickling lines do not appear to be a good decision.

Conclusion

The current proposal under consultation is driven mainly by financial criteria, primarily the low level of CAPEX. The current proposal risks leading to a situation where TSUK is not in a position to secure the required raw materials and substrates (slabs, coils, HBI, Pig Iron clean scrap, …), with a significant risk for the production rate, employees and customers. The current proposal puts TSUK at odds with the rest of the industry and does not guarantee long-term competitiveness.

The MU plan addresses all these issues and offer a viable alternative. It would allow TSUK to have time to develop additional downstream facilities but also other activities on the site of Port Talbot. It leaves the door open to better technological choices and saves thousands of jobs.

The MU plan requires £622m additional CAPEX compared to the initial proposal of TSUK in the case of a model based on 2x160t EAF for a total cost of £1,872m (including 30% contingency).

The MU plan would be £1bn less profitable (EBITDA) than the 0BF plan over the period 2026-2032. This figure would decrease when the redundancy package proposed by TSUK is factored in. The MU would nevertheless deliver a positive EBITDA between April 2025 and March 2032 and would reach a sustainable £200m EBITDA in 2032.

The MU proposal could be financed by the operations (EBITDA of £172m between 2026 and 2032) if the additional public support was at least £450m for a total of £950m allowing the gap for the £622m additional investment to be met.

The MU plan is the only solution offering to maintain all the volume currently produced by TSUK, a future for all the assets and roadmap for a just transition under the constraint of the financial hurdles and the reality of market dynamics for the UK steel industry.

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KNOWLEDGE FOR ACTION