Consider gaps, overlaps, timeline (questions/comments), and general questions or comments.
Suggested acronyms are provided in the headers per Sharon's opening comments.

# Subcommittee Report Outs

Add comments here that you think the full committee should consider regarding this subcommittee's scope and proposed work

## Barriers (B)

Can you explain comment about renewable energy being less expensive? My experience says we pay a premium for renewable energy.

Is it worth considering political barriers, such as if the legislative or executive branch of government decides not to prioritize industrial decarbonization?

## Workforce & Social Considerations (WSC)

Copying Comas's comment from chat here: Regarding the workforce & **"social considerations"* subcommittee, I was commenting that the **"social considerations"* reiteration reminds me that the CBPs have to account for the fact that certain communities that host manufacturing sites may be cautious/ concerned about new/different technologies (e.g., extensive use of H2 as a decarbonized fuel alternative). Community engagement and ultimately buy-in is pivotal.

It would be useful to get any available data on the net number of jobs resulting from decarb implementation cases in industries.

A question is whether CBP are within the ITIAC scope? I know that multiple offices at DOE are engaged already including OGC

Workforce is such an important issue I would advocate for keeping as a committee focus.

## Industrial Sectors (IS)

Indoor ag is a sector that has a high potential to become large given

Data centers are important for DOE to address, but not sure they should fall under ITIAC

One note would be that systems to datacenter and AI may represent a "barrier" to industrial decarbonization.

Consider explicitly adding semiconductor manufacturing, battery manufacturing, and other next generation industries that are the focus of the IRA and other reshoring investments

Also consider addressing explicitly recycling and remanufacturing industries necessary for dealing with clean energy technologies in the future and critical materials recovery

Access to clean electricity fist best in the cross-cutting technologies section rather than the section on industrial sectors, which I think covers solutions particular to specific industries.

Technology dissemination: US innovation to lead in Chemicals, Refining, Steel via H2 (beyond scrap), cement. International majors investing in R&D, but US manufacturers not leading US need to cover these sectors and their global importance. US is energy rich in renewables, some global industry may invest in new technology deployment in US vs. e.g. EU, for future expansion especially as carbon footprints become important economic considerations in international markets.

I'd consider primary steel and secondary (recycled) steel as separate sectors. There is no need to address secondary steel, which is made in electric arc furnaces. But the U.S. uses carbon-intensive (coal- and coke-based) primary steel production, and the U.S. could demonstrate new clean primary steel tech (h2-DRI, aqueous electrolysis, or molten oxide electrolysis).

Slight disagreement with this comment on steel. EAFs still need access to clean electricity - a barrier identified by the subcommittee. There is also work to be done on Scope 3 emissions for secondary steel.

But wholeheartedly agree that the issues in decarbonizing primary and secondary steel are different.

EAFs do use natural gas burners around the edges of the heating vessel to reduce electricity consumption and make heating more even. EAFs would need to avoid using these NG burners to be fully decarbonized.

## DOE Current Work & Gaps (DOE CW)

Joe Cresko says: "Quick comment for Jeff: the Office of Policy engages in issues regarding the industrial sector."

Jeff and Sue will add coverage of national labs to Section 1

Jeff mentioned overlap between different parts of DOE. Did you consider overlaps of the National Labs?

## Cross-Cutting Technologies (CCT)

I would consider (1) energy efficiency, (2) material efficiency and circular economy, and (3) electrification as some of the near-term priority areas, because they are efficient and the efficiency measures can save money.

Consider better defining the difference between AI and ML, or if these two should be combined under ML

There will be a need for a lot more electricity generation capacity and associated transmission and distribution infrastructure. The need is even higher for green H2 than for direct electrification due to energy losses when converting electricity to H2 and heat losses (e.g. in hot exhaust gas and formed water vapor) when H2 is burned. For this reason, we should use direct electrification for heating rather than burning hydrogen where feasible.

On H2, consider that after H2-DRI and H2 for chemicals (also with captured carbon), H2 supply might be limited, although the refining sector and blue hydrogen could be large sources as long as CCS can be deployed.

Hydrogen should be included, parallel with Electrification as another vector

It could be argued that H2 is linked to electrification since electrolytic H2 will probably dominate in the industry

Electrolytic hydrogen is limited in supply relative to the GW-scale energy needed in chemicals. Refinery offgas is stranded and flared unless can be converted into hydrogen with CCS to decarbonize.

## Economic Competitiveness (EC)

# Open Discussion

Add comments here that you think are important for the full committee during the open discussion period

### Gaps

Q for Zach/DOE: Are we covering everything that is required by us in the legislation, or are there gaps in relation to that mandate?

Semiconductor manufacturing. Growing energy intensive industry

Indoor ag should become a priority sector of the future. Add to industrial sectors committee

Re data: Suggestion for creating an industrial ATB (annual technology baseline, like already done with electricity), ongoing work with NREL and RFF on this and industrial data/modeling generally.

Page 6 of the US Industrial Decarbonization roadmap has industry at 30%. Transportation including shipping, aviation, rail, and road transport at 35%. residential at 19% and commercial at 17% of CO2 emissions. Surprising to see transport such as marine transport etc in our mandate???

### Timeline

### Overlaps

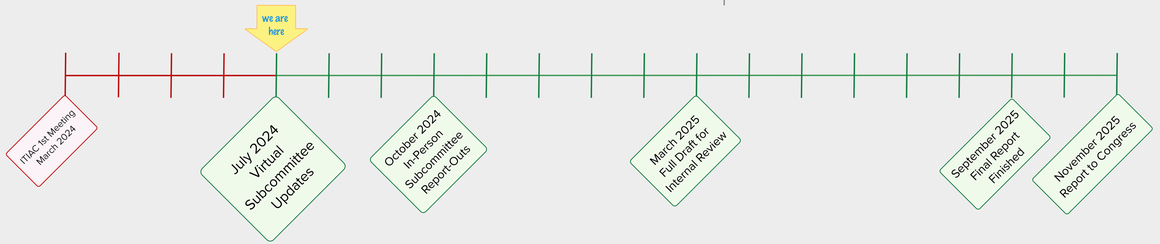
Workforce factors in multiple sub-committees.

Process-wise, we should build in touch points around the identified areas of subcommittee overlap

DOE Work and Gaps Assessment subcommittee necessarily relies on work of the other subcommittees. Maybe the outlining group can help identify which material goes into which part of the report.

### General

We should keep ITIAC focused on the industrial sector (e.g., manufacturing technologies and approaches), not the transportation sector. The manufacturing of batteries or fuels for use by the transportation sector can be within industry.

# Timeline

For your consideration during the open discussion, the timeline from our first meeting can be found below.