Asia Clean Energy Forum (ACEF) 2024

Energy Efficiency & Renewable Energy in the Industrial Sector

Wednesday, 5th June 2024

WRI Indonesia
What are the 3 main needs & 3 key solutions in the cement, iron & steel, food beverages, & textile industry?
The apparel & footwear, food & beverages, cement, & iron & steel industry in Indonesia have different but quite patterned emission & energy profile

**Emission Profile**
- Apparel & footwear, food & beverages have massive scope 3 emission, due to its extensive supply chain.
- Cement, iron & steel have massive scope 1-2 emission, due to intensive activity in its own production process.

**Energy Profile**
- Apparel & footwear, food & beverages use more electricity than heat.
- Cement, iron & steel use more heat than electricity.

**Hotspots**
- Apparel & footwear, food & beverages: purchased goods, upstream & downstream transportation & distribution.
- Cement: stationary combustion, calcination.
- Iron & steel: stationary combustion.

Understanding the industry’s energy & emission profile is key to find the right decarbonization solution.

In terms of industrial decarbonization, the industries have good progress in GHG accounting & net zero planning, but deteriorate in the implementation phase

<table>
<thead>
<tr>
<th></th>
<th>GHG accounting</th>
<th>Target Setting</th>
<th>Strategy Making</th>
<th>Strategy Implementation</th>
<th>Disclosure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apparel &amp; footwear</td>
<td>100%</td>
<td>100%</td>
<td>89%</td>
<td>44%</td>
<td>67%</td>
</tr>
<tr>
<td>Cement</td>
<td>67%</td>
<td>67%</td>
<td>67%</td>
<td>67%</td>
<td>67%</td>
</tr>
<tr>
<td>Food &amp; beverages</td>
<td>88%</td>
<td>63%</td>
<td>63%</td>
<td>38%</td>
<td>75%</td>
</tr>
<tr>
<td>Iron &amp; steel</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>50%</td>
<td>100%</td>
</tr>
</tbody>
</table>

This graph represents the percentage of companies conducting each activity within each sector.

Most of the sectors shows promising progress in emission accounting & target setting, start to diversify in strategy creation, & deteriorate in implementation & disclosure. At the same time, national & multinational companies have different pace of decarbonization. National companies has just started planning for decarbonization while most multinational company is already at the implementation stage. This resulted in MNCs’ active participation in technology lobbying, policy advocacy, & standardizing practices in its suppliers/value chain in Indonesia.

Source: Surveyed from 22 out of 50 KADIN NZH & CEIA members in four sectors who have at least signaled their intention to decarbonize.
**Road to finding the right solution**

**Understanding industries’ biggest challenges in net zero strategy implementation**

### Industries Biggest Challenge towards Decarbonization

<table>
<thead>
<tr>
<th>Financial &amp; Investment</th>
<th>Technical &amp; Infrastructure</th>
<th>Emission Reduction Governance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited funding</td>
<td>Lack of incentive</td>
<td>Lack of technical knowledge</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Lack of incentive</td>
<td>Lack of technical knowledge</td>
<td>Supply chain complexity</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Lack of technical knowledge</td>
<td>Supply chain complexity</td>
<td>LCT unavailability</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Supply chain complexity</td>
<td>LCT unavailability</td>
<td>Business competitiveness uncertainty</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>LCT unavailability</td>
<td>Business competitiveness uncertainty</td>
<td>Lack of buy-in from stakeholders</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Limited government push</td>
<td>Lack of buy-in from stakeholders</td>
<td>Limited government push</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

### Biggest challenges for industries in general:

- **45%** Limited funding
- **41%** Lack of technical knowledge
- **18%** Supply chain complexity

### Sector-specific challenges:

#### Apparel & footwear

- **67%** Limited funding

Apparel & footwear is a low margin industry, transformation towards net zero is perceived as too big of an investment.

#### Cement

- **67%** Competitiveness uncertainty

There’s low demand for green product in national market & no national green cement standard.

#### Food & beverages

- **38%** Lack of technical knowledge, limited funding

Require technological & practice changes while most of the human resource are low skilled worker.

#### Iron & steel

- **100%** Lack of technical knowledge

Ever-evolving climate policies, hard to catch up to the requirements.

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Source: Surveyed from 22 out of 50 KADIN NZH & CEIA members in four sectors who have at least signaled their intention to decarbonize.
Climate finance remains untouchable for Indonesian industries due to low awareness & complex requirement

Currently, industries still have low awareness about climate finance.

- **Don't understand**: 57%
- **Is considering**: 29%
- **Failed to access**: 5%
- **Succeed**: 10%

The available commercial financing product is still perceived as exclusive due to its high requirement & complexity.

- **No information on product**: 55%
- **Not eligible to fulfill the standard**: 36%
- **Weak balance sheet**: 9%

The most preferable instrument

- **Equity**: 10%
- **Bond**: 11%
- **Loan**: 30%
- **Insurance**: 18%

Industries have high expectation from the government to help them carry the weight of high investment cost.

- **Want PPP scheme**: 69%
- **Expect subsidy from government**: 57%

Indonesian industries are still in the early stages of accessing climate finance for decarbonization. However,

- Loan, especially low-interest loan is preferred due to their relatively easier requirements compared to the other instrument.
- Industries are less concerned whether the funding is labeled as "climate finance" or others, their priority is to get the finance mobilized.

Source: Surveyed from 22 out of 50 KADIN NZH & CEIA members in four sectors who have at least signaled their intention to decarbonize.
**Green electricity**

- **Current available & implementable technology**: unbundled REC & RtS.
- **Most needed technology**: RtS & a variety of other models such as green tariffs & PPA.
- **Issues surrounding current green electricity solution**: (i) 15% limitation of RtS generation capacity, (ii) threat of REC double counting, & (iii) questions around additionality of unbundled REC.

**Ideal specification for green electricity solution**:
- Grid location: close, in one island (59%)
- Matching: yearly matching (50%)
- Ambition: high & very high (54%); industry wants in minimum to participate in planned development of RE with significant financial support (e.g., PPA), best if they can have its own off-grid RE plant

**Clean heat**

- **55% of industries that uses heat haven't implement any clean heat technology.**
- **Current available & implementable technology**: biomass, mostly used for co-firing with fossil fuel.
- **Most needed technology**: electrified heat from clean source & biomass from agriculture (as transitional solution). Hydrogen is the only undeveloped clean heat technology.

**Issues surrounding current clean heat solution**: (i) sustainability, security (price) & resilience of biomass & waste supply, & (ii) grid is not yet green for electrified heat.

**Ideal specification for clean heat solution**:
- Own plant (53%)
- Third-party owned plant used with other companies (e.g., district heating) (27%)

Source: Surveyed from 22 out of 50 KADIN NZH & CEIA members in four sectors who have at least signaled their intention to decarbonize.
Hence, to reach net zero, the apparel & footwear, food & beverages, cement, & iron & steel industry require general & sector specific solution based on its context & needs

<table>
<thead>
<tr>
<th>Context</th>
<th>General solution</th>
<th>Sector-specific solution (technology-related)</th>
<th>Sector-specific solution (non-technology-related)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apparel &amp; footwear</td>
<td>Low margin &amp; labor-intensive industry</td>
<td>1. Enable financial incentives &amp; build market for low-carbon product</td>
<td>Electricity: generate own electricity (RtS)</td>
</tr>
<tr>
<td></td>
<td>Dominant energy use: electricity</td>
<td>Launch profit-generating &amp;/or cost cutting schemes to alleviate the financial burden of transition.</td>
<td>Heat: electrified heat from clean source</td>
</tr>
<tr>
<td></td>
<td>Scope 3 &gt;&gt; Scope 1 + 2</td>
<td>2. Climate solution development</td>
<td>Electricity: generate own electricity (RtS)</td>
</tr>
<tr>
<td></td>
<td>Opportunity-seeking</td>
<td>Develop accessible, diverse, high-quality technologies for decarbonization.</td>
<td>Heat: biomass from agriculture</td>
</tr>
<tr>
<td></td>
<td>Food &amp; beverages</td>
<td>3. Enforce wider decarbonization for supply chain</td>
<td>Electricity: generate own electricity (RtS)</td>
</tr>
<tr>
<td></td>
<td>Low-skilled worker, well-established</td>
<td>Influence supply chain companies to decarbonize as they’re the source of its principal’s scope 3 emission.</td>
<td>Heat: biomass from agriculture</td>
</tr>
<tr>
<td></td>
<td>Dominant energy use: electricity</td>
<td>4. Ensure industry’s competitiveness in global market</td>
<td>Electricity: green tariff &amp;/or PPA</td>
</tr>
<tr>
<td></td>
<td>Scope 3 &gt;&gt; Scope 1 + 2</td>
<td>Establish standard &amp; policies to guide industries towards net zero while aligning &amp; responding to global market dynamics.</td>
<td>Heat: renewable gas &amp; green hydrogen</td>
</tr>
<tr>
<td></td>
<td>Stability-seeking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cement</td>
<td>SOE, advanced in net zero efforts</td>
<td>Apparel &amp; footwear</td>
<td>Financial support</td>
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<td></td>
<td></td>
<td></td>
<td>Assistance to tackle supply chain complexity</td>
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<td>Financial support</td>
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<td>Technical assistance</td>
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<td></td>
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<td></td>
<td>Green product procurement policy to boost competitiveness in domestic market</td>
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<td></td>
<td></td>
<td></td>
<td>National green product standard for cement (SNI)</td>
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<td></td>
<td>Incentive-based decarbonization standard</td>
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<td></td>
<td>National response &amp; preparation towards the rise of climate-related trade policies from global market</td>
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<td></td>
<td></td>
<td>Incentive-based decarbonization standard</td>
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<tr>
<td>Iron &amp; steel</td>
<td>Export-heavy, most impacted by trade policies (e.g., CBAM)</td>
<td>Apparel &amp; footwear</td>
<td>Financial support</td>
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Therefore, any industrial decarbonization policy framework must address all three interconnected aspects of the challenge: finance & investment, technical & infrastructure, & emission reduction governance

Source: Surveyed from 22 out of 50 KADIN NZH & CEIA members in four sectors who have at least signaled their intention to decarbonize.
How can policy frameworks be designed to enable a supportive ecosystem for the adoption of decarbonization technologies?
We formulate a framework to guide the government towards building Indonesia’s net zero ecosystem for decarbonization, based on industry’s perspective.

**Industry-Led Decarbonization Framework**

### PHASE

**Establishment**
- Policy framework to kick-start industry net zero transition

**Development & Testing**
- Policy framework to support wider industrial decarbonization adoption

**Long-Term Implementation**
- On-going deep decarbonization across all industry sector

### ASPECT

**TECHNOLOGY & INFRASTRUCTURE**
- Readiness of technology & supporting infrastructure for adoption

**FINANCE & INVESTMENT**
- Financial support & investment for industries' decarbonization initiatives

**EMISSION REDUCTION GOVERNANCE**
- Governance mechanism & standards to support the industrial decarbonization journey
We formulate a framework to guide the government towards building Indonesia’s net zero ecosystem for decarbonization, based on industry’s perspective

### Industry-Led Decarbonization Framework

<table>
<thead>
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<th>Phase 1: Establishment</th>
<th>Phase 2: Development &amp; testing</th>
<th>Phase 3: Long-term implementation</th>
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<tr>
<td>Policy framework to kick-start industry net zero transition</td>
<td>Policy framework to support wider industrial decarbonization adoption</td>
<td>On-going deep decarbonization across all industry sector</td>
</tr>
</tbody>
</table>

#### TECHNOLOGY & INFRASTRUCTURE
- **Increase quality & diversify** green electricity procurement options, implement immediate clean heat technologies, & push for other technology options.
- **Implement innovative** green electricity procurement options, incentive for new clean heat technologies, & develop ecosystem for wider EE & RE techs.
- Unlock cross-sectoral deep decarbonization through electricity (EV & electric heating), mainstream new technologies (incl. in the heavy industries).

#### FINANCE & INVESTMENT
- **Harmonize** the stakeholders on lingo & institutional setting (incl. taxonomy), prepare a level playing field through carbon pricing.
- Principle: Strive to achieve harmonised climate finance governance.
- **Implement the prepared mechanisms** (e.g., ETS, concessional loan, tax exemption) for prioritized industries.
- Principle: optimize government subsidy to alleviate financial burden of industry’s transition towards net zero.
- Scale up the prepared mechanisms for wider industries & create mature market for climate responsive financial product & blended finance for industrial decarbonization.
- Principle: decrease subsidy & optimize market-based & commercial mechanisms.

#### EMISSION REDUCTION GOVERNANCE
- **Establish harmonized organizational-level standard for industrial decarbonization** & robust product-level standard for low carbon product, as well as provide decarbonization-related national data & MRV platform.
- **Adopt standard for prioritized industries** while leveraging the use of MRV platform & build domestic market competitiveness for low carbon product. Connect the compliance towards standard to financial & non-financial incentives.
- Adopt standard for wider industries & ensure competitiveness of national low carbon product in global market.

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Thank You

Wednesday, 5th June 2024

WRI Indonesia
Conclusion

To create an optimal enabling condition for industrial decarbonization, these indicators must all be available (re: green)
### Industry-Led Decarbonization Framework

<table>
<thead>
<tr>
<th>Phase 1: Establishment</th>
<th>Phase 2: Development &amp; testing</th>
<th>Phase 3: Long-term implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepare financing &amp; investment for industrial decarbonization</td>
<td>Facilitate financing &amp; investment for industrial decarbonization</td>
<td>Scale up &amp; create mature market for climate responsive financial product &amp; blended finance for industrial decarbonization</td>
</tr>
<tr>
<td>Develop <strong>transition finance instruments</strong> aligned on industrial decarbonizations (e.g., taxonomy, guideline, &amp; FSA Reg. on SF targeting industry)</td>
<td>Support climate responsive financial product, <strong>sector specific decarbonisation financing</strong> facility (e.g., explore PPP, concessional loan for industry)</td>
<td>All financial products and services <strong>aligned</strong> with climate outcomes (taxonomy, standard)</td>
</tr>
<tr>
<td>Formulate <strong>national budget planning for incentive</strong> (e.g., tax reduction/exemption, concessional loan)</td>
<td>Available <strong>incentive-based regulation</strong> (tax reduction or exemption (e.g., corporate decarbonization standard implementation)) from <strong>carbon pricing income</strong></td>
<td>Government <strong>decrease subsidy &amp; use carbon pricing</strong> income to accelerate green project</td>
</tr>
<tr>
<td>Create program to increase climate-related finance for financial sectors &amp; industries</td>
<td>Provide <strong>financial aid</strong> (rebate, etc) &amp; assistance (PPP, concessional, guarantee for SMEs, etc) for SMEs &amp; supply chain partners</td>
<td></td>
</tr>
<tr>
<td>Prepare carbon pricing &amp; crediting mechanism to incentivize industrial decarbonization</td>
<td>Implement carbon pricing &amp; crediting mechanism for selected industry</td>
<td>Implement carbon pricing &amp; crediting mechanism for wider industry</td>
</tr>
<tr>
<td><strong>Set-up carbon pricing</strong> (carbon trading &amp;/or carbon tax) for industrial sector</td>
<td>Carbon pricing mechanism <strong>tested</strong> for selected industrial sector</td>
<td>Carbon pricing <strong>fully operated</strong> for all industry sector</td>
</tr>
<tr>
<td>Set up <strong>emission reduction crediting mechanism</strong> (e.g., establish emission reduction methodology for industry)</td>
<td>Emission reduction crediting <strong>tested</strong> for selected industrial sector</td>
<td>Emission reduction crediting <strong>fully operated</strong> for all industry sector</td>
</tr>
</tbody>
</table>

**Note:**
- **Available**
- **Available, but needs improvement**
- **Not available**
## Industry-Led Decarbonization Framework

### Phase 1: Establishment
Policy framework to kick-start industry net zero transition

1. Establish harmonized standard for industrial decarbonization
2. Establish a standard for industrial decarbonization, & ensure alignment with international standard & latest science (e.g., update SH)
3. Set sectoral carbon cap/emission reduction pathway for prioritized industry & integrate to decarbonization standard
4. Build standard for low carbon product

### Phase 2: Development & testing
Policy framework to support wider industrial decarbonization adoption

1. Adopt standard for prioritized industry
2. Mandatory implementation for prioritized industry
3. Provide non fiscal incentives for industry (e.g., ease of permit)
4. Set cross-sector carbon cap/emission reduction pathway for wider industry & integrate to standard
5. Build market competitiveness for low carbon product
6. Establish domestic low-carbon product market through policy enforcement (e.g., green procurement product mandate)

### Phase 3: Long-term implementation
On-going deep decarbonization across all industry sector

1. Adopt standard for wider industry
2. Mandatory implementation for wider industry
3. Enforce non fiscal incentives for industry (e.g., ease of permit)
4. Update all pathway/tighten cap based on latest science development
5. Scale up market competitiveness for low carbon product
6. Establish domestic low-carbon product market through consumer enablement (e.g., product data transparency)

### Emission Reduction Governance

<table>
<thead>
<tr>
<th>Note:</th>
<th>Available</th>
<th>Available, but needs improvement</th>
<th>Not available</th>
</tr>
</thead>
</table>

### Conclusion

The list will be updated further to better reflect development among both the industry & government.