Assessing health impacts of energy transition technologies

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Introduction

- Eni’s new mission was developed to better capture the company’s goal of promoting a just transition.
- The Company’s business model on energy transition requires significant changes in the organization. There are direct and in-direct implications to Eni’s of managing health aspects in the projects.
- In this new model, the Health of workers, their families and communities remains at the heart of the business.
- Continuous research and innovative approaches are essential for the good governance of the health system both for workers, their families and for the communities surrounding the Company’s industrial activities.
- Eni’s objective in advancing research on Energy Transition and Health is to ensure alignment and consistency with:
  - Eni’s mission and strategy
  - The SGDs
  - Eni’s positioning in Health
  - Strengthening Eni’s role as Global and lead player in the just and energy transition context
  - National and international regulation
Eni - Technologies and Risks Evaluation for Energy Transition

**PRIVETARY AND BREAKTHROUGH TECHNOLOGIES**
A portfolio of technologies to meet decarbonized energy needs

**RENEWABLES & NEW ENERGIES**
- Magnetic Fusion
- Energy Storage
- Wave Energy

on the path to clean and reliable energy

**DECARBONIZED SOLUTIONS**
- Carbon Capture Utilization & Storage
  deploying safe, easy to apply and cost-effective solutions for CO₂ capture, utilization and storage

**CIRCULAR & BIO PRODUCTS**
- Advanced Biofuels
- Bio-feedstock
- Hydrogen
- Waste Valorization

for a rapid transition to low-carbon mobility and circularity

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1. **EVOLUTION OF THE HEALTH SYSTEM**
   - Roles and responsibilities for wellbeing
   - Human Capital Management
   - New and emerging health technologies
   - Health priorities of the current decade (2030)
   - Pandemic preparedness, response and recovery

2. **REGULATORY ANTICIPATION AND RISK OF LACK OF CONSISTENCY ON POSITIONING ON EMERGING HEALTH ISSUES**
   - Direct Impacts of Climate
   - Ecosystem-Mediated Impacts of Climate Change
   - Other environmental stressors related to new energy

3. **INCREASING ATTENTION AND REQUESTS FOR DISCLOSURE BY STAKEHOLDERS AND SHAREHOLDERS**
   - Sustainability
   - Health co-benefits of climate change and energy policies
Eni - Energy Transition and Human Health

Epidemiological Assessment and Industrial Hygiene - the interaction between environment and health and health impacts of industrial activities

- Data on health effects for solar and wind power is scarce:
  - CSP: few studies available (model-based); no direct evidence of possible effects.
  - Wind power: relatively large number of studies (self-reported information on outcome and often also on exposure) potentially causing recall bias. No clear associations reported in the few studies with some form of validation of exposure.
  - No longitudinal (cohort) studies have been conducted in subjects exposed to wind turbines.
- Good quality studies needed on health effects of renewable energy.
  - Should include populations and patients with well-characterized exposure.
  - High-quality information on outcome, and assessment of potential confounders.
- Retrospective studies might produce useful results, but prospective longitudinal ones would be the strongest.
- A variety of LCA studies have been conducted for other technologies reporting low levels of emissions, few studies included a comparison with fossil-based technologies.
- Comprehensive assessment of exposure levels (residential and occupational) from operating plant.
- Ad-Hoc model-based studies of potential health effects based on exposure estimates.

Infectious diseases, emerging diseases and regional/global health emergencies

- Strengthening Preparedness systems and drafting Emergency Preparedness Plans in a One Health perspective.
- Reinforcing epidemiological emergencies monitoring, in collaboration with International Public Health Institutions.
- Promoting Use and provision of technologies and digital platforms supporting Public Health during emergencies.
- Fostering Public-Private Partnerships.
- Consolidating for evidence-based communication systems implementation to keep citizens/workers informed and updated.
- Boosting Development of evidence-based decision making at corporate level.
- Strengthening political will to build health surveillance models in collaboration with International Health Institutions.

Health and Social Health Models and Systems

- Review of the literature on welfare models.
- Analysis of the weight of private consumption in the healthcare sector in Italy.
- Definition of the key transformational drivers (aging population, new available services thanks to scientific progress, prevention centrality, community focus).
- Framing of Eni’s corporate health-welfare model with respect to existing configurations.
Next Step
Adapt the company health management system with focus on:
- Health surveillance programme
- Occupational Health with appropriate health risk assessment and Industrial Hygiene monitoring programme
- Community health impact assessment and sustainable programmes
- Health Promotion Programme

OBJECTIVES & SCOPE
- Evaluate Occupational related health risks
- Evaluate environmental health risks and opportunities (*)

* Keeping in mind a comparison between biorefineries and traditional refineries
**PROJECT 1 - HEMORRHAGIC FEVERS**

**GOAL AND OBJECTIVES**
- Set tool for a better control of hemorrhagic fever epidemics (Ebola, Lassa fever and Marburg), through the identification of environmental and population risk factors

**OUTCOME**
- Risk factors associated to hemorrhagic fever
- Practical tools to assess three risk ranges for the development of epidemics of hemorrhagic fever specific to the geographical areas
- Controls measures geographically customised

**PROJECT 2 – CLIMATE CHANGE**

**GOAL AND OBJECTIVES**
- Reduce the risks associated to burden of diseases through adequate public health actions

**OUTCOME**
- Identification of highest priority pathologies associated to climate change based in the geographical area’s context
- Description of the public health interventions to reduce / control pathologies associated to burden of diseases or clinical conditions
- Define factors or KPI to evaluate and estimate the associated efficacy of each public health intervention
Area 4: Accountability in and Definition of Corporate Welfare Model

Corporate Welfare Model Accountability and Eni Salute Case Definition

- 2nd & 3rd year research path envisaged based on 1st year outcomes.

Year 2 - Evaluate Culture of Health in Eni

Develop a “user’s perspective” through a survey of employees’ cohort. Objectives:

- Corporate accountability & guidelines development.
- Tailoring corporate services to the expectations and needs of potential users.

Year 3 - Set Health Culture Corporate Strategy

- Focus on the uniqueness of "Eni Health Case" in the literature of oil & gas companies.
- Introduce the historical relationship between the corporate welfare services choices and the different historical phases of the NHS.
<table>
<thead>
<tr>
<th>Healthcare System</th>
<th>Community Health</th>
<th>Healthy Families and Children *</th>
<th>Leadership for Better Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>o Improve healthcare for our workers in terms of quality and value</td>
<td>o Improving Environmental and Health resilience through the culture of Health Impact Assessment</td>
<td>o Childhood Obesity</td>
<td>o Health Leadership Development with internal and external stakeholders</td>
</tr>
<tr>
<td>o Extend/optimise healthcare coverage and access</td>
<td>o Diseases Prevention and Health Promotion through needs assessment</td>
<td>o Economic Inclusion for Family Wellbeing</td>
<td>o Nurses and Nursing*</td>
</tr>
<tr>
<td>o Explore opportunities within public and private health systems</td>
<td>o Social Determinants of Health including health disparities with focus on vulnerable groups</td>
<td>o Valuing Caregivers and Families</td>
<td>*Pertaining to Company provided health services</td>
</tr>
</tbody>
</table>

*Pertaining to employee families.
Health Impact from Biogas Production Process and Biomass Combustion

Surrounding community & environment

Field assessment would be the next step – ongoing

• Pre-screening of actual company biogas facilities and locations
• Selection would be based on general context with focus on:
  • Potential health issues
  • Existence of surrounding subpopulation
  • Data availability

The potential occupational and community hazards associated to biogas plants from literature review:

• Biogas plants included in the study highlighted the release of VOCs, gaseous pollutants and particles such as: 1,2-dichloroethane; Benzene; ethylbenzene; 1,1,2-trichloroethane; tetrachloroethylene; styrene; tetrachloromethane; and limonene
• Design control measures may be recommended to reduce emissions i.e. methane from the digestion tank
• Epidemiological screening highlights the importance of health surveillance program on workers and residents as to their lifetime for more efficient assessment of potential health effects
• Biological risk (e.g. airborne micro-organisms) has to be further assessed using the available methods (e.g. CAMNEA Method)
• Eutrophication at the digestor and the presence of heavy metals concentration in digestate should be further assessed

Limitations in the definition of consistent benchmarks:

• Limited number of studies including on-field and site data collection and monitoring
• Specificities of the national standards and the use of different technologies do not enable a direct comparison among different studies
Systematic literature reviews to further investigate:
  o Technical features and local standards
  o On-field monitoring
  o Quality of data collected
  o Context specific features

IOGP Health Committee and Energy Transition taskforce to:
  o Advance awareness and knowledge on the health-related risks, impacts and opportunities identified by the energy industry in the evolving context of the energy transition.
  o Leveraging on IOGP’s Energy Transition Directorate and key topics: The four Energy Transition topics are: Electrification, Carbon Capture Transportation and Storage, Minimization of all flaring and venting activities, Best available technology in energy efficiency

Outcome:
  o Summarize the current status of knowledge in the energy sector on the health risks, impacts and opportunities associated with the energy transition
  o Evidence of the efforts done by the sector so far on lowering carbon emissions
  o Provide business leaders with information that will enable them to consider the health impacts in future decision making

Where we are:
  o Scope and objectives of TF approved
  o Index of the highlevel document approved
  o Questionnaire: final version to be shared and approved
  o Breakout sessions (two groups) on chapter 2 and 3 of approved index to be started
Conclusion and Way Forward

- Complete this year program for better understanding of health-related risks and impacts linked to the energy transition
- Selection of next year program based on priorities and the level of impact on the business
- Reinforce the stockholder engagement through the different networks
Let’s continue the conversation!
Post questions and comments in the IAIA23 app.

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