sustainability

MDPI

Appendix

Systemic analysis of the contributions of co-located Industrial Symbiosis to achieve sustainable development

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Received: date; Accepted: date; Published: date

11 **Table S1.** Summary of the questionnaire distributed in the industrial park to collect materials data

Raw materials / Auxiliary materials ▪ Units per year ▪ Destination (process) ▪ General characteristics (composition, purity, etc.) ▪ Storage type (atmospheric tanks, low-pressure tanks, containers, tank cars) ▪ Storage conditions (special pressure and temperature) ▪ Supplier ▪ Use ▪ Does it require any treatment prior to its manufacturing process? YES ▪ Is any waste generated at this stage? YES ▪ Amount ▪ What is the destination of such waste? It is reused in another line of the manufacturing process ▪ Does it need any treatment prior to use? YES ▪ Indicate the destination or process NO ▪ Indicate the destination or process It is sent to waste treatment plant ▪ Fill in the "Residual flows" tab (Flow supply) NO NO
Auxiliary production services ▪ Supply / Distribution ▪ Amount ▪ General characteristics (composition, purity, etc.) ▪ Storage type and conditions ▪ Supplier ▪ Use ▪ Destination (maintenance, office, machinery, waste treatment)
Waste ▪ Supply / Treatment / Management ▪ Name ▪ State (liquid, solid or gas) ▪ Temperature ▪ Amount ▪ Origin ▪ Hazardousness ▪ Storage type and conditions ▪ Does the company apply any treatment? YES ▪ Type of treatment ▪ Why is it treated in the company? NO ▪ Fill in the "Waste flow management" tab ▪ Characteristics after treatment ▪ Destination ▪ Fill in the "Waste flow management" tab ▪ Can it be sent to landfill or some external management is required? LANDFILL ▪ Where? Why? EXTERNAL MANAGEMENT ▪ Who? Why? OTHER MANAGEMENT OPTIONS ▪ How? Who? Where? Why?

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Table S2. Summary of the questionnaire distributed in the industrial park to collect water data

- Supply
  - Origin (network, groundwater, recirculation, surface)
    - Flow
    - Type of water
    - Mean temperature
    - Does water require any general treatment before use?
      - YES
        - Type of water after treatment
        - Temperature of water after treatment
      - NO
- Distribution
  - Origin with respect to the supply
  - Flow
  - Destination / area to use
  - Purpose
    - Type of water
    - Temperature
    - Could another type of water be used for this purpose?
      - YES
        - Type of water
      - NO
- Post-use
  - Origin
  - Type of water
  - Temperature
  - Is any use given to its calorific value?
    - YES
      - Destination
    - NO
      - Destination
        - Recirculation
          - Does it require any pre-treatment?
            - YES
              - Destination
            - NO
              - Destination
        - Purification / Treatment
          - Fill in the "Residual flows" tab (Flow supply)

16 **Table S3.** Summary of the questionnaire distributed in the industrial park to collect steam data

- Generation
  - Only steam
    - Flow
    - Output characteristics
      - Output steam characteristics
        - Pressure
        - Temperature
    - Consumption characteristics
      - Fill in the "Water" tab (Flow distribution)
      - Fill in the "Fuel" tab (Fuel supply)
  - Steam-electricity cogeneration
    - Flow
      - Generated steam characteristics
        - Pressure
        - Temperature
    - Output characteristics
      - Fill in the "Electric Energy" tab (Combined cycle, steam)
      - Output steam characteristics
        - Pressure
        - Temperature
    - Consumption characteristics
      - Fill in the "Water" tab (Flow distribution)
      - Fill in the "Fuel" tab (Fuel supply)
  - Only electric energy
    - Flow
  - Generated steam characteristics
  - Pressure
  - Temperature
  - Output characteristics
  - Fill in the "Electric Energy" tab (Combined cycle, steam)
  - Consumption characteristics
  - Fill in the "Water" tab (Flow distribution)
  - Fill in the "Fuel" tab (Fuel supply)
- Distribution
  - Consumptionº point
    - Steam type
    - Flow
    - Use
- Post-use
  - Origin
    - Flow
    - Post-use or condensate steam characteristics
      - Pressure
      - Temperature
      - State
    - Is there any steam emission to the atmosphere?
      - YES
        - Emission point
        - Emission cause
          - Unprofitable
          - Unnecessary
          - Failures and unexpected events
      - NO
        - Is it recirculated to the general supply or is it used for another purpose?
          - Recirculated
          - Reused
            - Consumption location, purpose, flow

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