Fraunhofer UMSICHT

Fraunhofer Institute for Environmental, Safety and Energy Technology UMSICHT

Fraunhofer UMSICHT
Institute Branch Sulzbach-Rosenberg

Ensemble pour une Gestion Intégrée et Durable des Déchets (EGIDD)

Dr.-Ing. Peter Degener

Waste-to-Resources, 6th of June 2023, Tunis

Fraunhofer UMSICHT - Pioneer for a sustainable world

Concepts and technologies for shaping the energy and raw materials transition

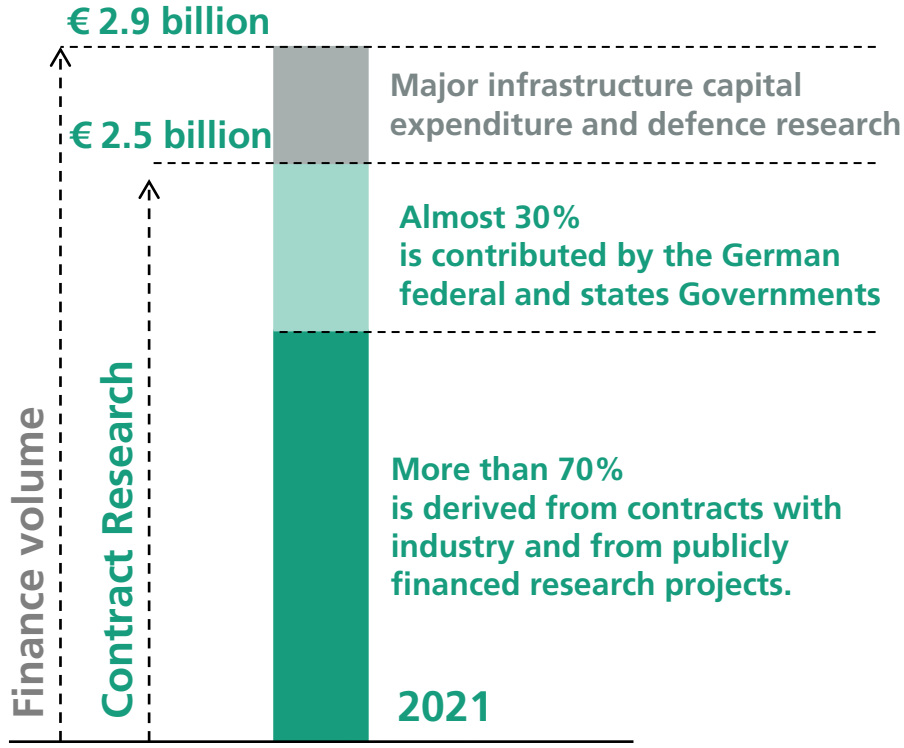
Fraunhofer-Gesellschaft

At a Glance

Applied research organization prioritizing key future-relevant technologies and commercializing its findings in business and industry. A trailblazer and trendsetter in innovative developments and research excellence.

30 000 staff

76 institutes and research units



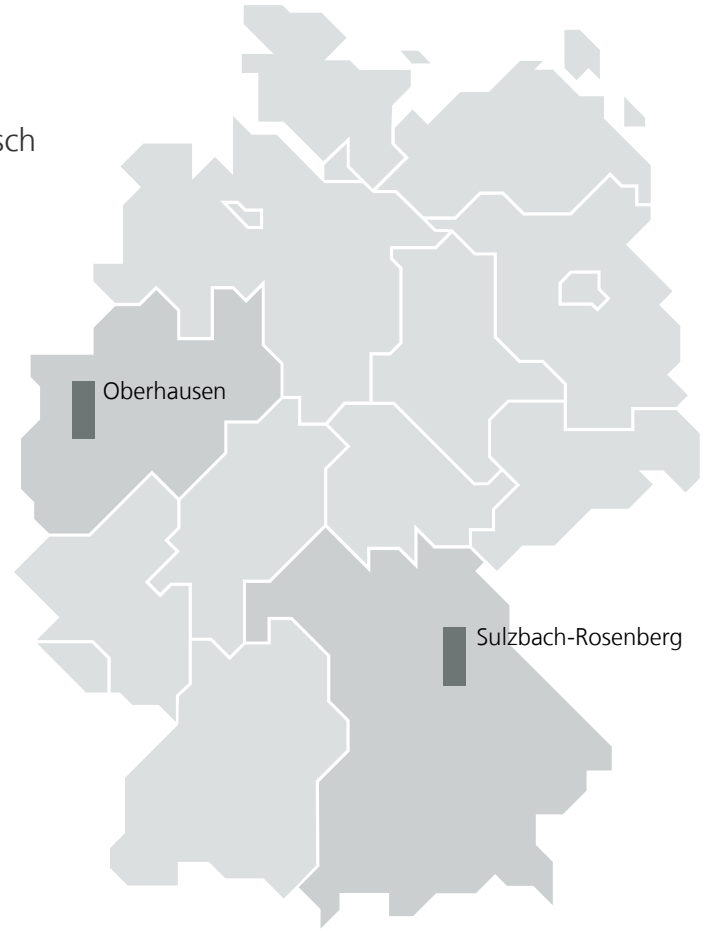
Fraunhofer UMSICHT

Headquarter and institute branch

Directors
Prof. Dr.-Ing. Manfred Renner | Prof. Dr.-Ing. Christian Doetsch

Fraunhofer UMSICHT OBERHAUSEN

Staff	440
Turnover	39.8 Mio EUR
Technical infrastructure	4,500 m²



Director Institute branch
Prof. Dr.-Ing. Matthias Franke

Institute Branch SULZBACH-ROSENBERG

Staff	104
Turnover	10.2 Mio EUR
Technical infrastructure	2,100 m²

Status: August 2022

EGIDD-Project

Overview: Key Information

Funding by Bavarian State Chancellery

- Duration: **August 2018** to December 2018 (Phase1) and July 2019 to **May 2022** (Phase 2)
- Funding: Free State of Bavaria via Bavarian State Chancellery
- Budget: **approx. 1.1 Mio. €** for both phases
- Consortium: Fraunhofer UMSICHT (lead), WtERT Germany GmbH, em&s GmbH, RSL GmbH and envero GmbH
- Tunisian partners: **Agence Nationale de Gestion des Déchets (ANGed)**, and
- Municipalities of **Siliana, Tabarka and Douar Hicher** (Manouba, near Tunis)

Fraunhofer UMSICHT

Support for Decisions WtERT Material AND Energy Recovery

em&s experts in markets and sciences

RSL Recycling Solutions Lippetal

envero

Agence Nationale de Gestion des Déchets ANGed

EGIDD-Project

Overview: Challenges and Motivation

- **Transition** from centralize to decentralized **responsibilities**; e.g. waste collection and composting of the municipalities; transfer stations, transport, treatment and landfills of ANGed
- **Lack** of local and regional **structures** for **waste collection** and **treatment** for household and commercial waste
- Thus, **lack** of **cleanliness** in the municipalities
- **Recycling** activities must be extended
- **Lack** of **collection** and **treatment** of **organic waste**
- Insufficient treatment of **Waste of Electrical and Electronic Equipment** (WEEE)

EGIDD-Project

Overview: Goals

Cooperation Tunisia and Bavaria/Germany for transfer of knowledge and technology in the field of cleanliness and waste management

Improvement of the environmental situation in model municipalities

Start and foster recycling activities

Create job opportunities, prospective for setting up companies and give perspectives for young people

EGIDD-Project

Overview: Locations, Subprojects

1. Cleanliness and Waste collection points

- 1 waste collection point, and
- Awareness campaigns for each municipality

2. TransferStation^{PLUS}

- Conceptual designs for all municipalities

3. Composting

- Pilot plant in Tabarka
- Simplified concept for Siliana

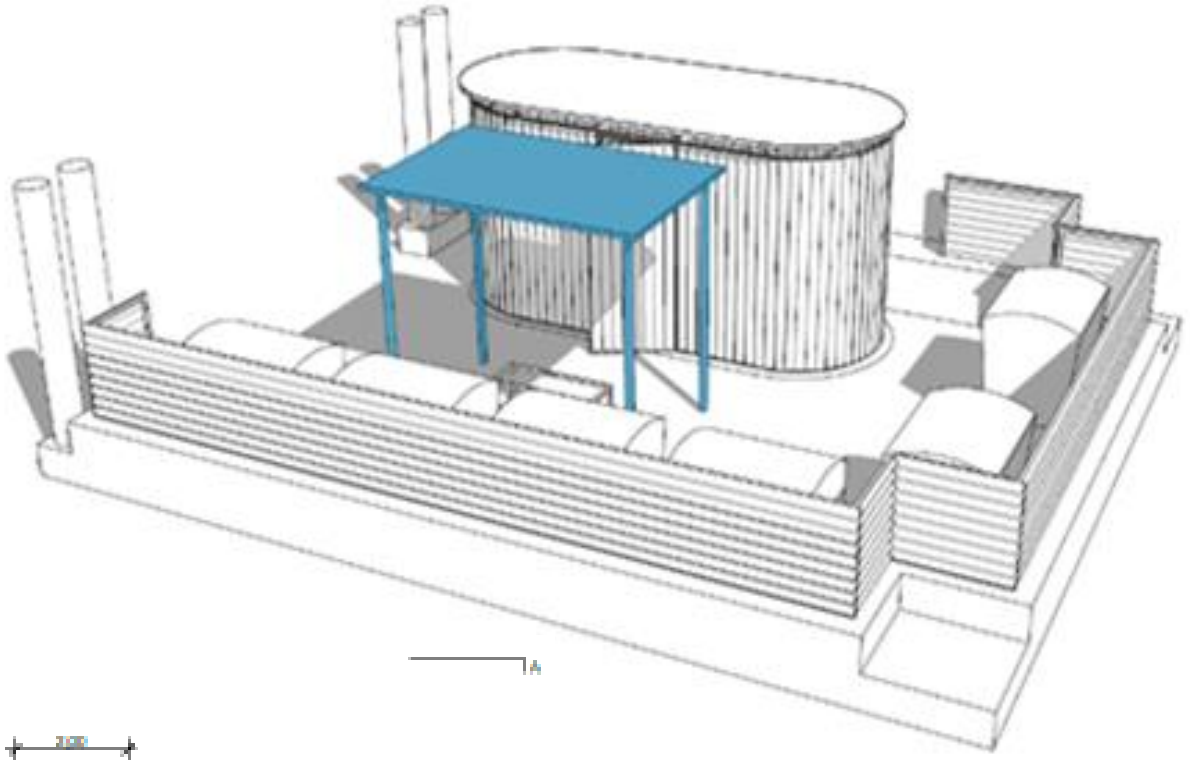
4. WEEE treatment

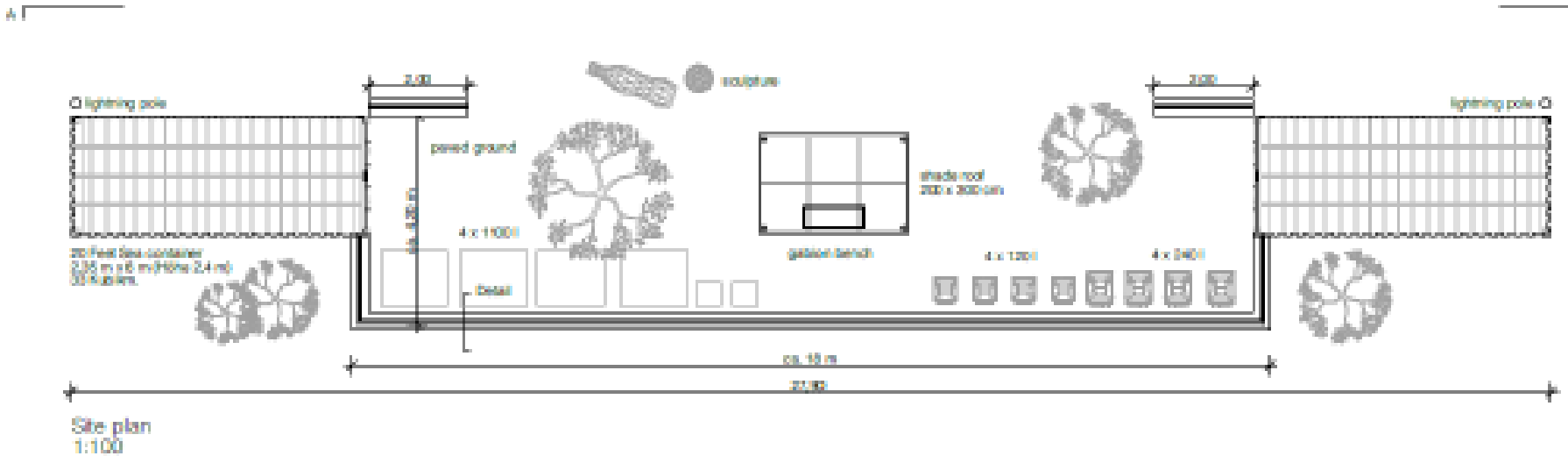
- Improvements of existing plant at Borj Chakir, and
- 4 work stations, and 1 CRT disintegration plant

5. Knowledge management and transfer

EGIDD-Project

Achievements: Collection points (Ile de Proprete)

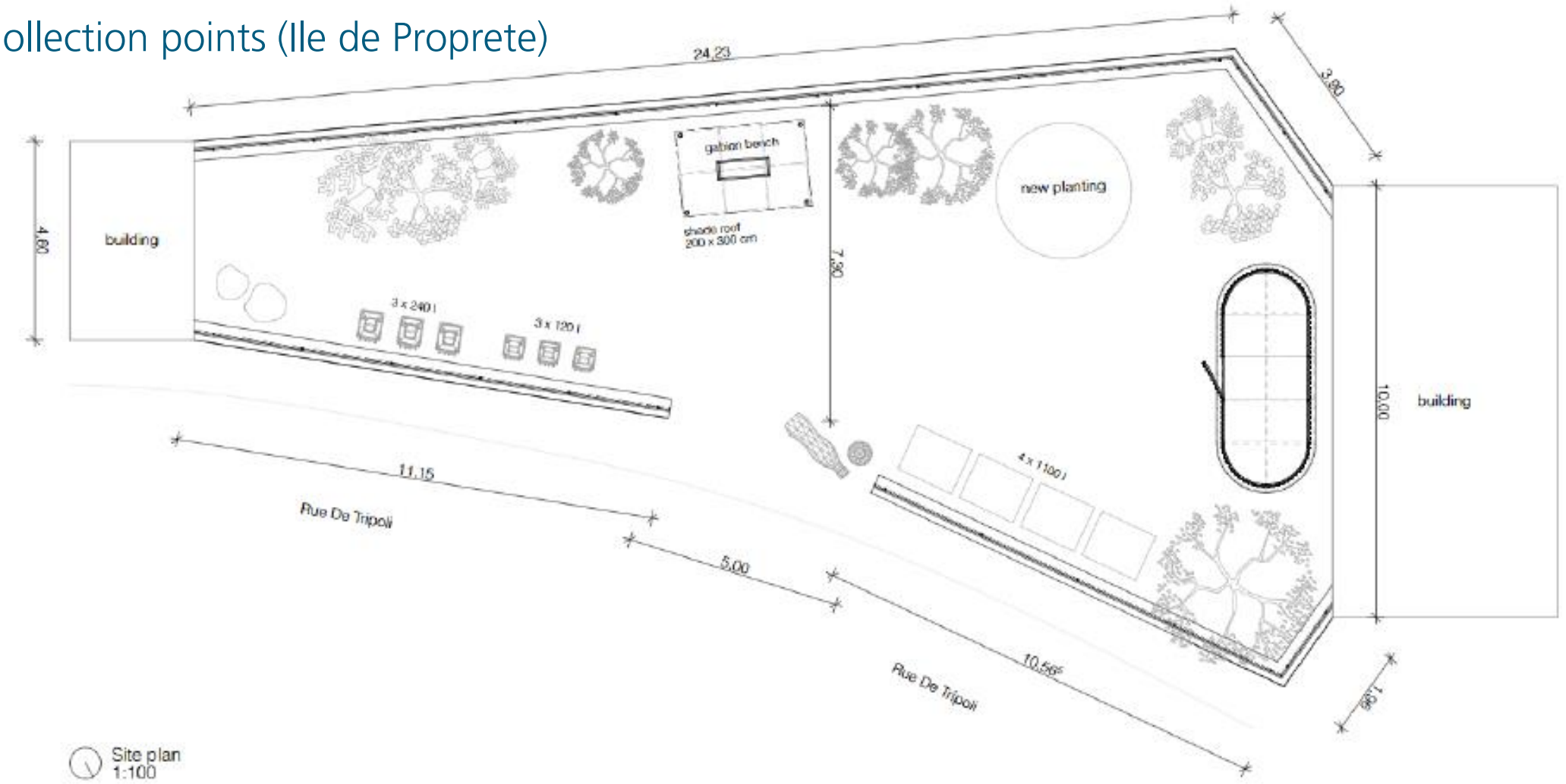




Siliana: Market hall and Avenue Abdessatar Dridi (Design M. Heinsdorff, WtERT)

EGIDD-Project

Achievements: Collection points (Ile de Proprete)



Douar Hicher: next to Jardin d' enfants de la rue de Tripoli (Design M. Heinsdorff, WtERT)

EGIDD-Project

Achievements: Collection points (Ile de Proprete)

Ready built in Siliana, Tabarka and Douar Hicher

Construction costs: around 15,000 € per point

Jobs created: at least 1-2 per point

Purchaser for segregated materials identified

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Achievements: Collection points (Ile de Proprete)

Inauguration: Siliana (June 2021), Tabarka (May 2022) and Douar Hicher (November 2022)

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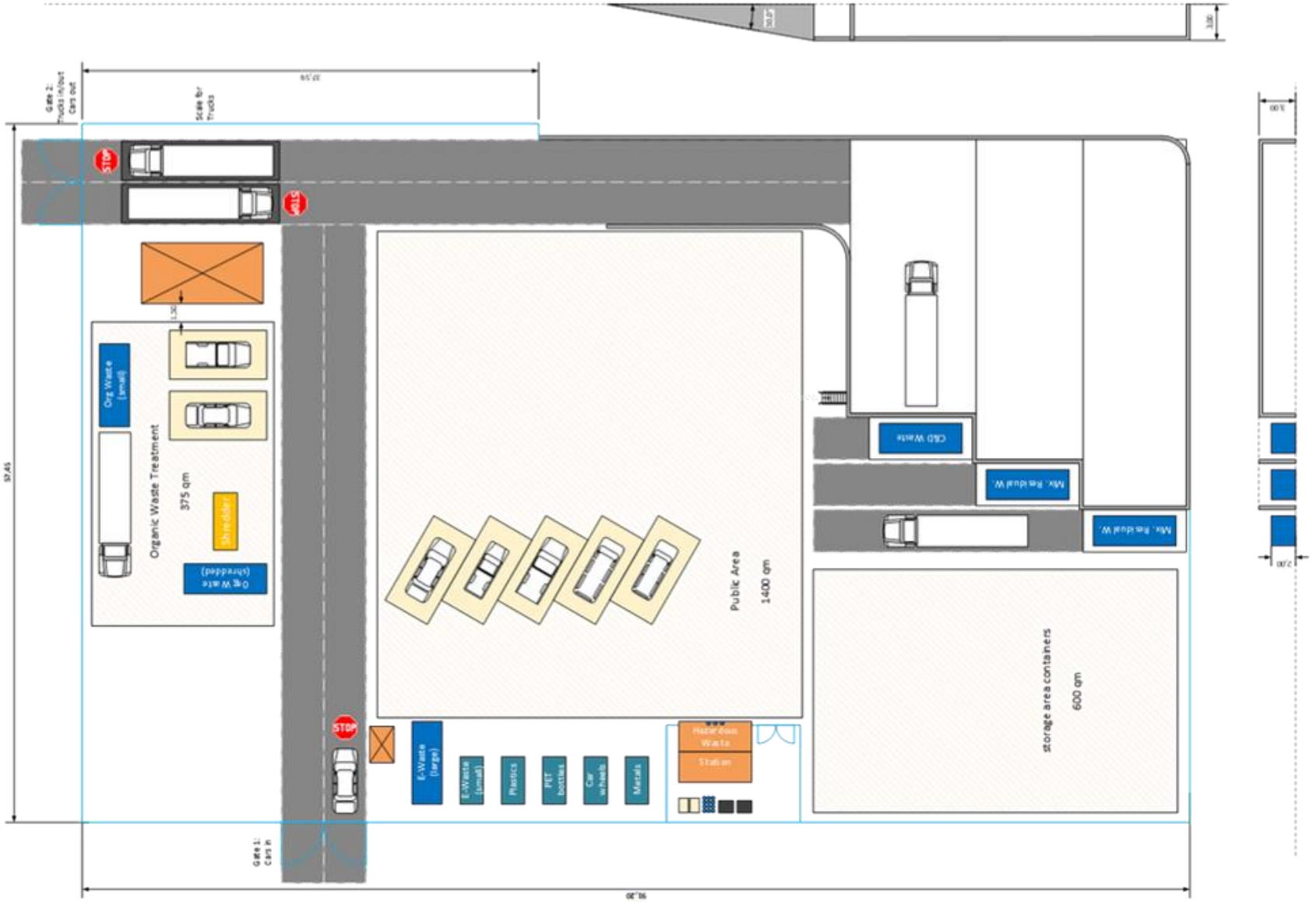
Achievements: TransferStation^{PLUS}

- Creation of individual concepts depending on the available land plot of each municipality including facilities for separate waste reception and storage, and sorting
- here: Concept for Tabarka

- Throughput: up to 15,000 Mg/a
- Jobs: at least 6-8
- Concept can be easily adapted to other Tunisian regions



Concept of Transferstation^{Plus} with waste separation for Tabarka

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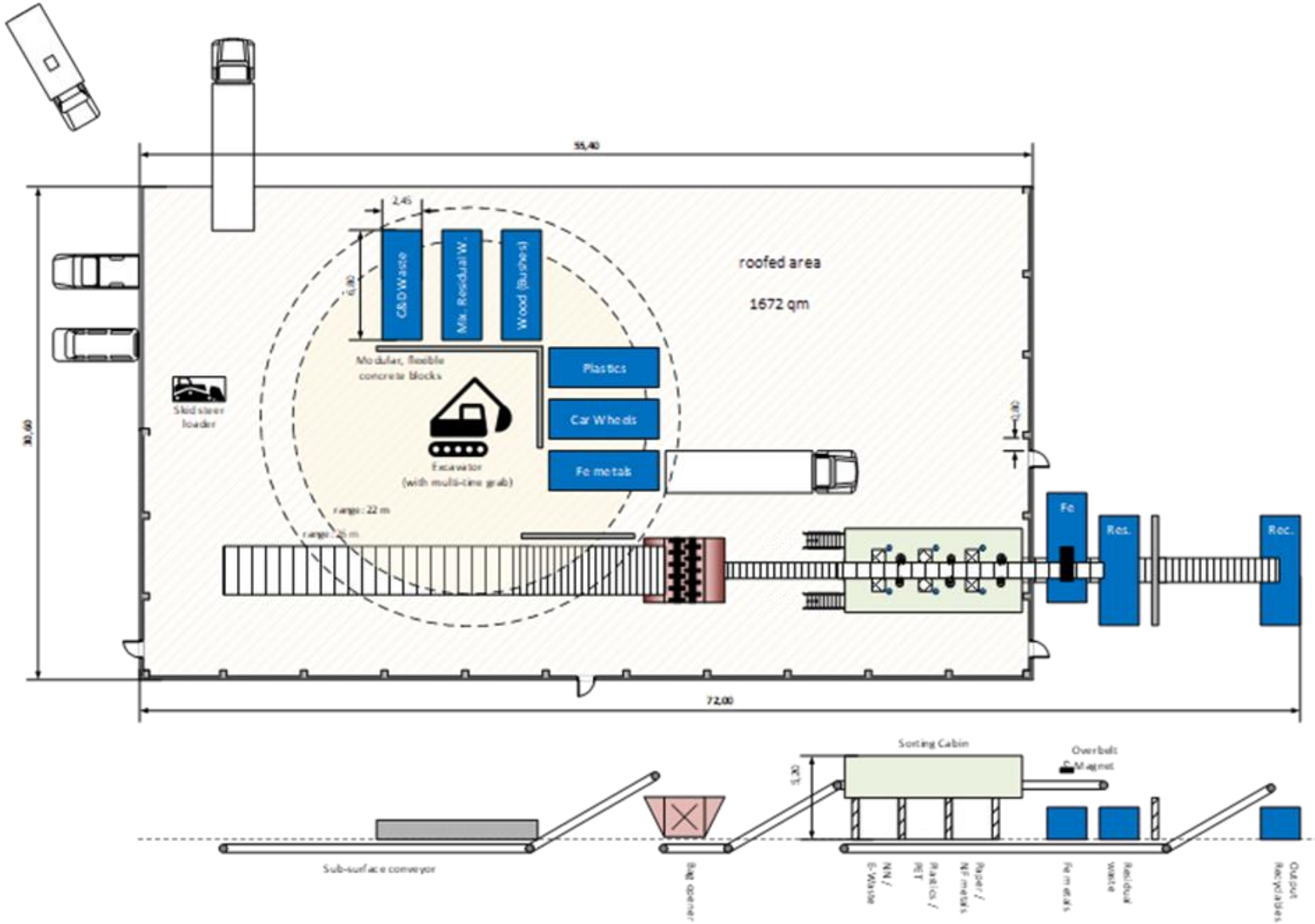
Achievements: TransferStation^{PLUS}

- **Low-tech sorting plant to produce quality recyclables at low investment and operating costs for Douar Hicher**
- **Throughput: up to 36,000 Mg/a**
- **Jobs: up to 28-32**
- **Concept can be easily adapted to other Tunisian regions**



Concept TransferStation^{PLUS} with sorting plant for Douar Hicher

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Achievements: Composting

Composting plant (mobile) delivered and commissioned including training in May 2022 in Tabarka:

- Shredder, drum screen, wheel loader, Gore-Tex-cover and aeration / control unit
- Value assets: approx. 180,000 €
- Throughput: 1,500 - 2.000 Mg/a
- Jobs created: at least 1-2
- Compost purchaser identified

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Achievements: WEEE-treatment

- **Recommendations to improve the existing plant operation at Borj Chakir to multiply the capacity (e.g. focus on efficient shredding and dismantling): from approx. 200 Mg/a to approx. 2,800 Mg/a**
- **Higher revenues through training for efficient sorting of valuable materials (e.g. PCB)**
- **4 additional manual dismantling workplaces with tool sets handed over**
- **Value assets: approx. 10,000 €**

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Achievements: WEEE-treatment

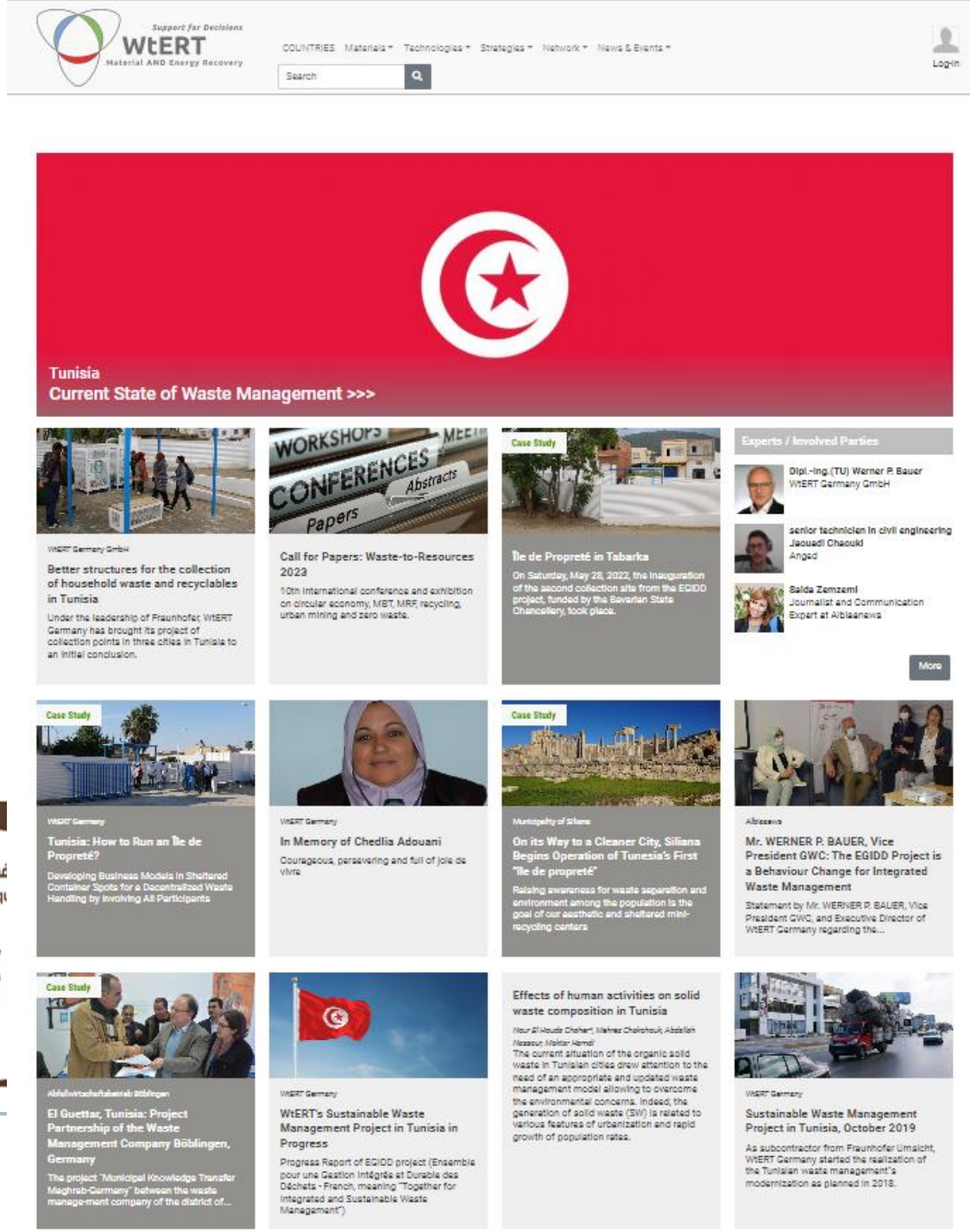
- **CRT treatment plant with spare parts delivered and training conducted in March 2022 at Borj Chakir**
  - First-of-its-kind plant for environmentally friendly dismantling of CRT in Tunisia
  - Capacity up to 50-60 CRT per hour
    ➔ up to 180,000 CRT per year (approx. 1,800 Mg/a)
  - Value assets: approx. 60,0000 €

- **Establishment of hazardous material handling and awareness of its relevance**

Project results

Knowledge management and transfer

- **Through a multitude of workshops, individual trainings and information campaigns by the Bavarian team and ANGed**
- **Through the web-based platform: WtERT.net for waste management experts and best-case studies (worldwide)**



EGIDD-Project
Outlook

Challenges that remain

- Lack of overachieving structures such as regional waste treatment facilities or at least state-of-the-art landfills for household and commercial waste
- Lack of segregation and treatment, e.g., by composting, for high share of organic waste
- Treatment of WEEE: e.g., LCD-panels, batteries, accumulators, refrigerators and air conditioners

Project continuation (planned)

- Phase 3 (but funding not secured so far)
- Multiply successful approaches of phase 2 in the model municipalities and involve further regions
- Solve other challenges, e.g., establish TransferStation^{PLUS}, improve landfill management or extend WEEE-treatment

Many thanks for your attention

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