

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

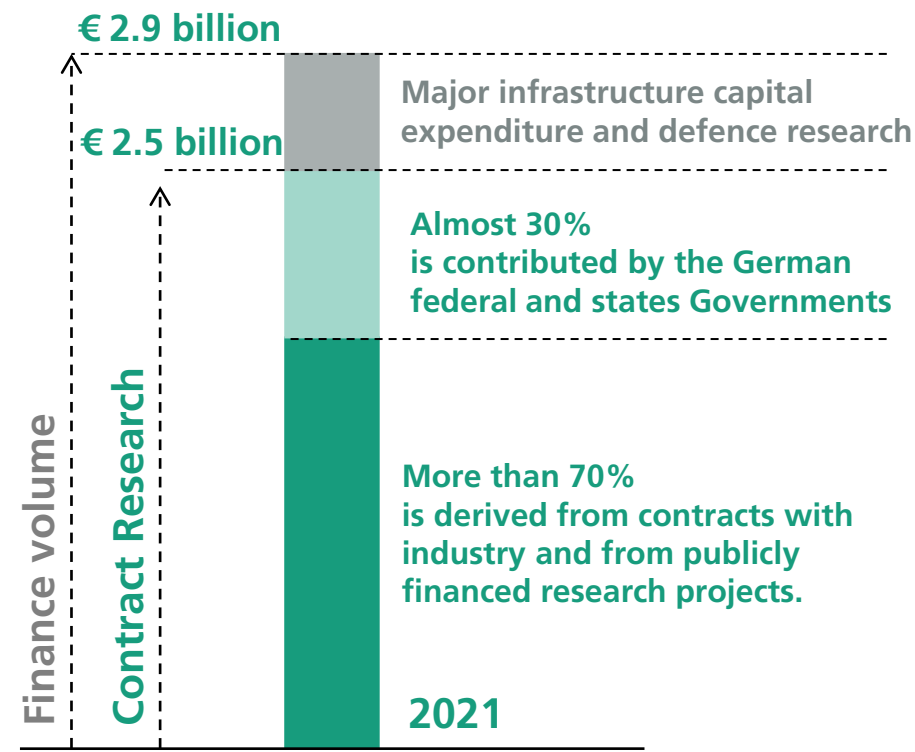
Applied research organization prioritizing key future-relevant technologies and commercializing its findings in business and industry. A trailblazer and trendsetter in innovative developments and research excellence.



30 000 staff



76 institutes and research units



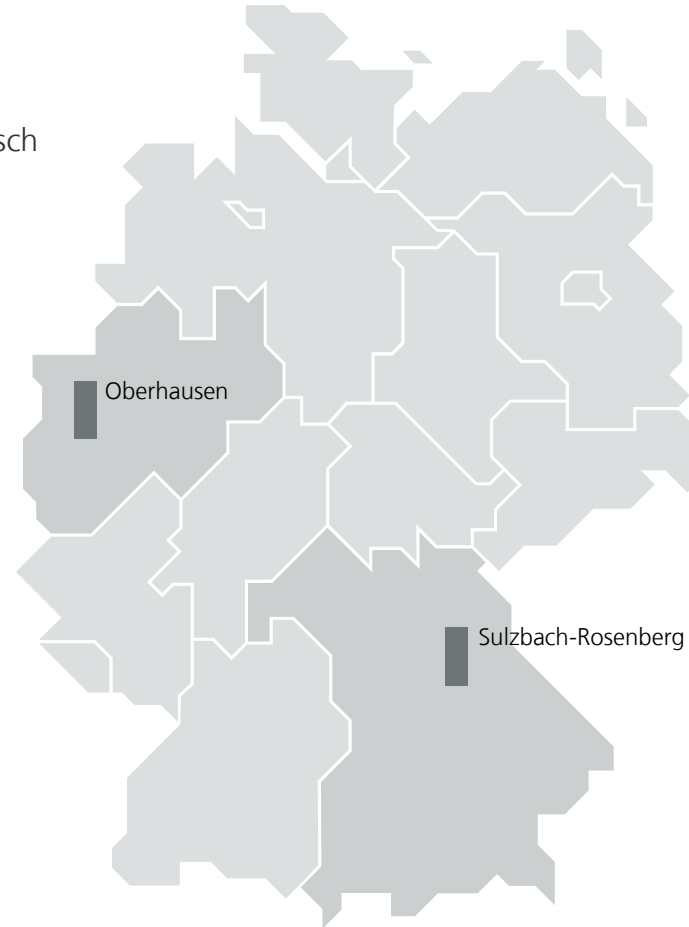
Fraunhofer UMSICHT

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 m ²



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

Institute Branch SULZBACH-ROSENBERG

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



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)



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

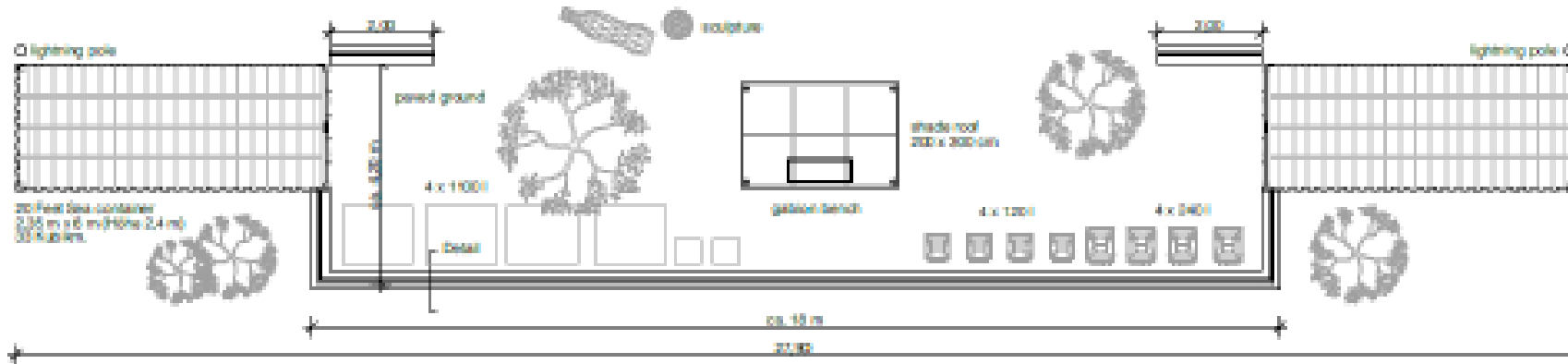
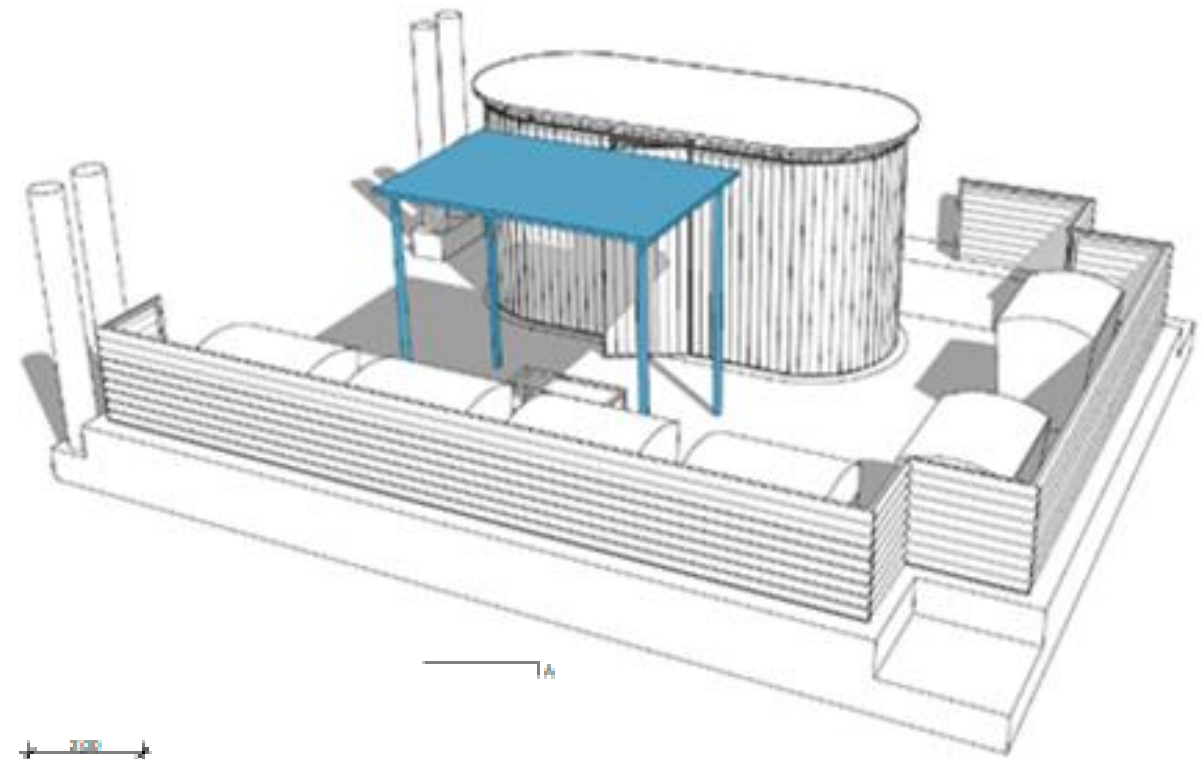
4. WEEE treatment

- 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)

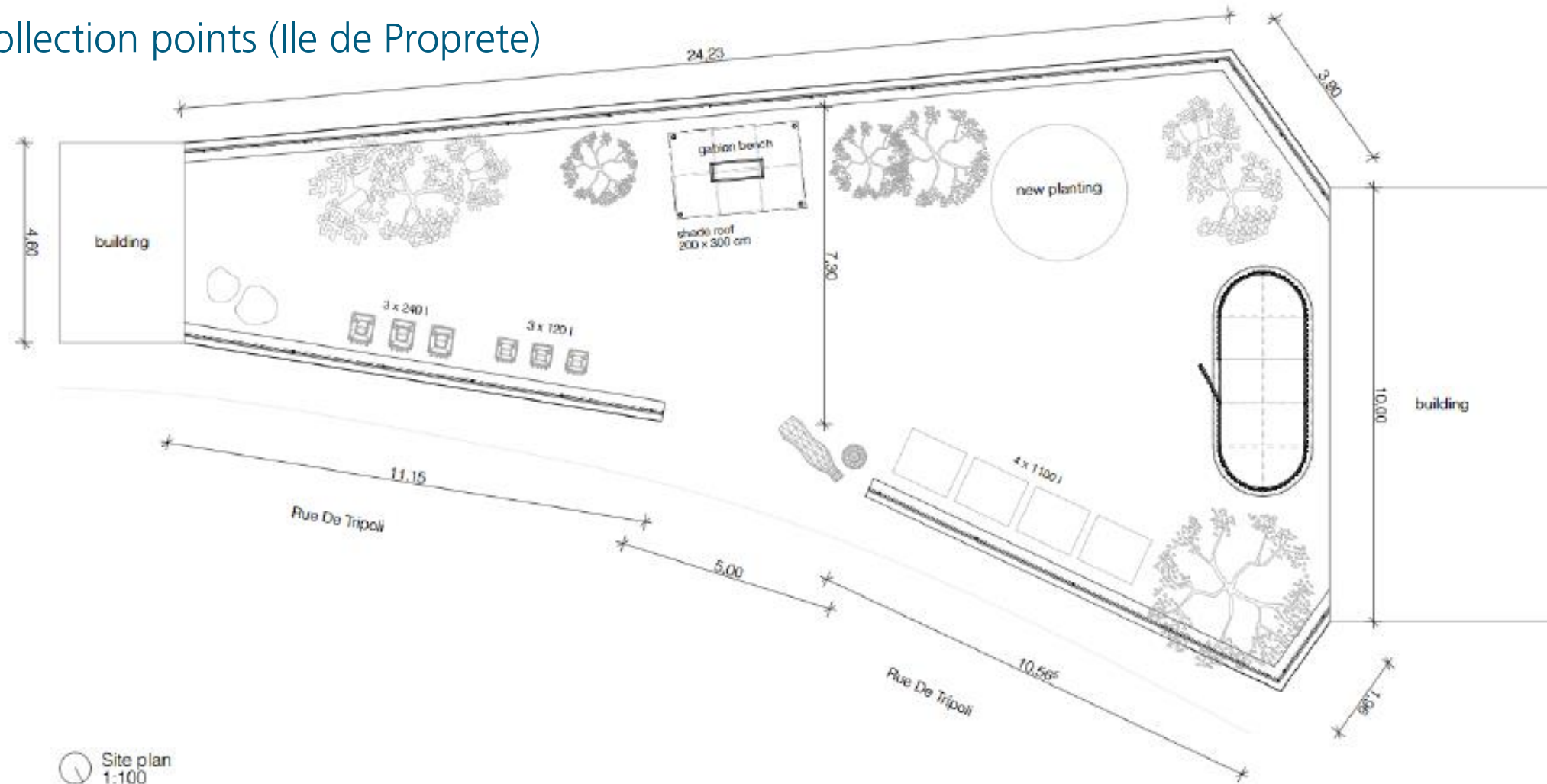


Site plan
1:100

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

EGIDD-Project

Achievements: Collection points (Ile de Proprete)

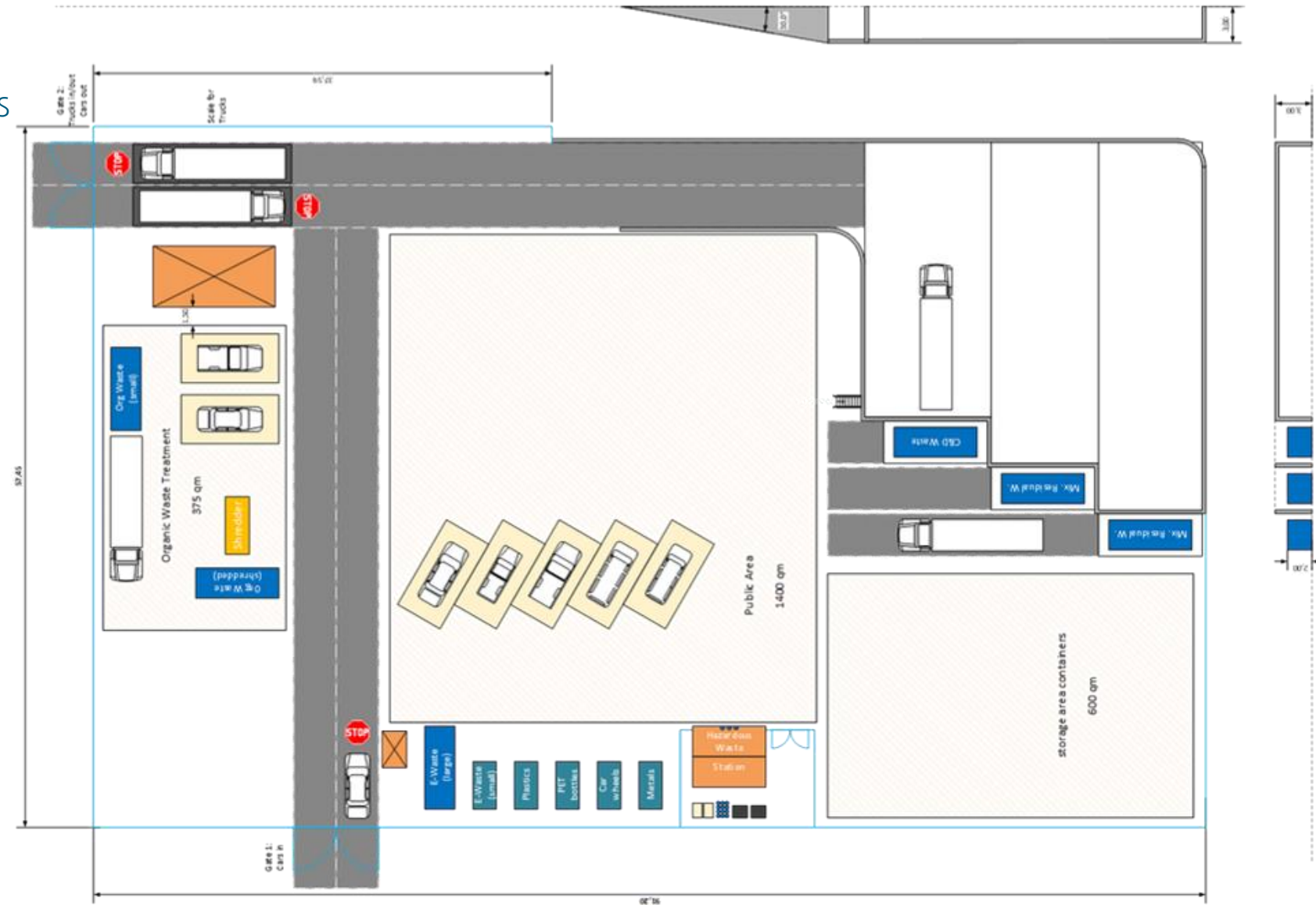


Inauguration: Siliana (June 2021), Tabarka (May 2022) and Douar Hicher (November 2022)

EGIDD-Project

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

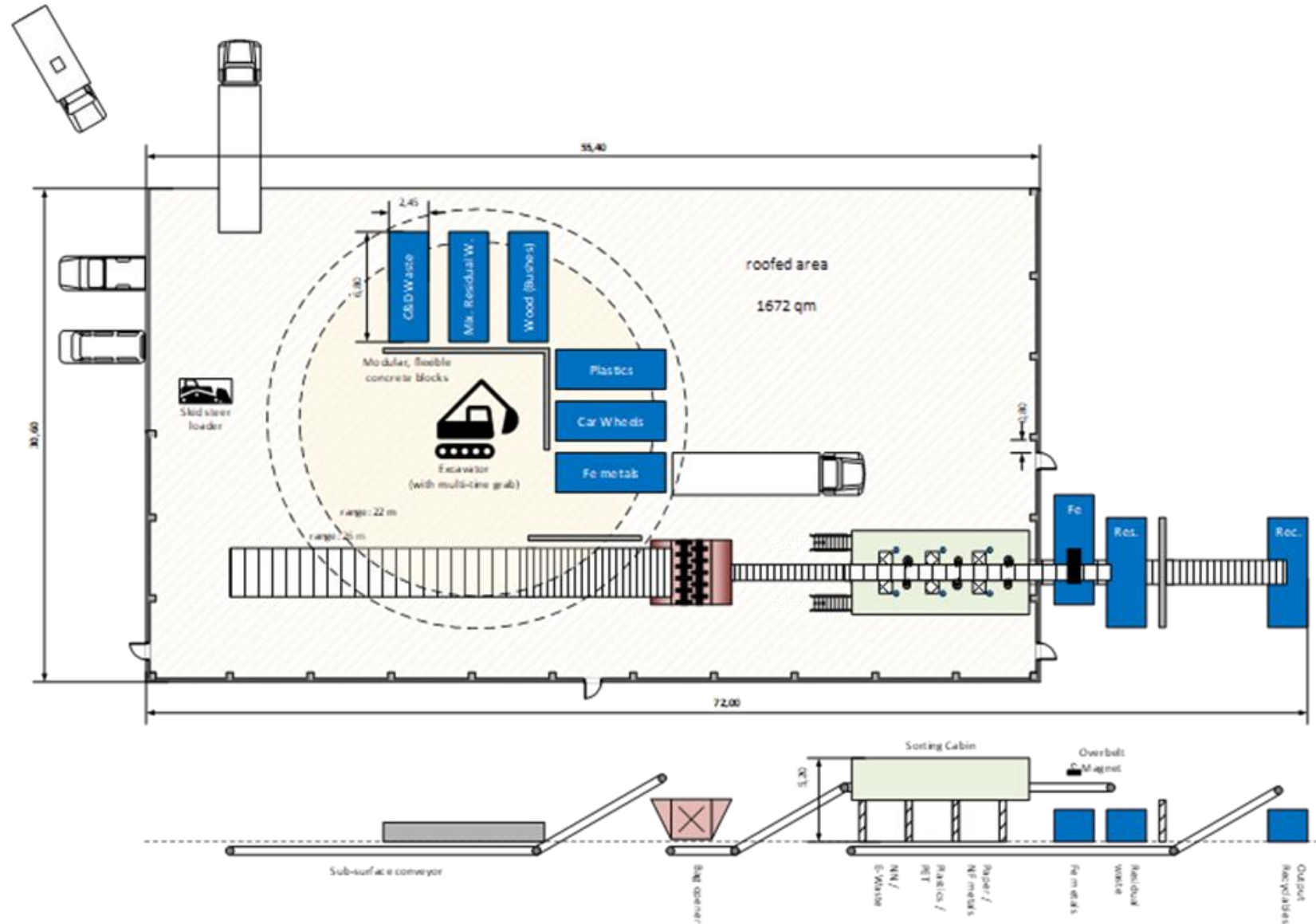


Concept of Transferstation^{Plus} with waste separation for Tabarka

EGIDD-Project

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

EGIDD-Project

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

EGIDD-Project

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 €

EGIDD-Project

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](https://www.wt-ert.net) for waste management experts and best-case studies (worldwide)



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Better structures for the collection of household waste and recyclables in Tunisia

Under the leadership of Fraunhofer, WtERT Germany has brought its project of collection points in three cities in Tunisia to an initial conclusion.

Call for Papers: Waste-to-Resources 2023

10th International conference and exhibition on circular economy, MBT, MRF, recycling, urban mining and zero waste.

Île de Propreté in Tabarka

On Saturday, May 28, 2022, the inauguration of the second collection site from the EGIDD project, funded by the Bavarian State Chancellery, took place.

Experts / Involved Parties

WtERT Germany GmbH

Jaouadi Chaouki
Ange

Journalist and Communication Expert at Albiatnews

Tunisia: How to Run an Île de Propreté?

Developing Business Models in Shared Container Spots for a Decentralized Waste Handling by Involving All Participants

In Memory of Chedli Adouani

Courageous, persevering and full of joy de vivre

On its Way to a Cleaner City: Siliana Begins Operation of Tunisia's First "Île de Propreté"

Raising awareness for waste separation and environment among the population is the goal of our aesthetic and sheltered mini-recycling centers.

Mr. WERNER P. BAUER, Vice President GWC: The EGIDD Project is a Behaviour Change for Integrated Waste Management

Statement by Mr. WERNER P. BAUER, Vice President GWC, and Executive Director of WtERT Germany regarding the...

Effects of human activities on solid waste composition in Tunisia

(Hous Elhouada Chahart, Mehrez Chahouch, Abdellah Messous, Moktar Hamdi)

The current situation of the organic solid waste in Tunisian cities drew attention to the need of an appropriate and updated waste management model allowing to overcome the environmental concerns. Indeed, the generation of solid waste (SW) is related to various features of urbanization and rapid growth of population rates.

WtERT's Sustainable Waste Management Project in Tunisia in Progress

Progress Report of EGIDD project (Ensemble pour une Gestion Intégrée et Durable des Déchets - French, meaning "Together for Integrated and Sustainable Waste Management")

Sustainable Waste Management Project in Tunisia, October 2019

As subcontractor from Fraunhofer UMSICHT, WtERT Germany started the realization of the Tunisian waste management's modernization as planned in 2018.

EGIDD-Project

Outlook

Challenges that remain

- Lack of overarching 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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