



Implementation of Cleaner Technologies and Pollution Control in Turkey

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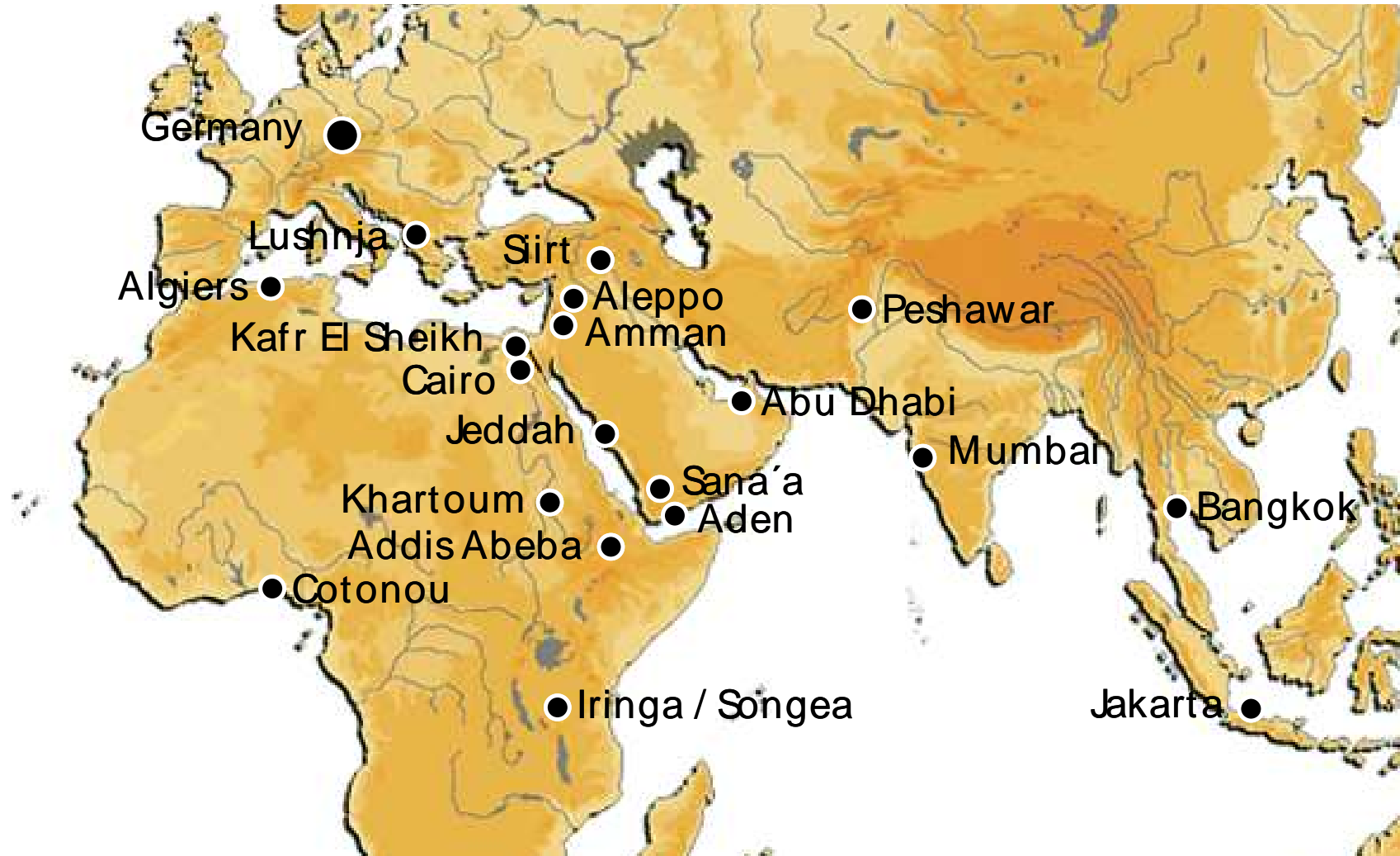
Introduction

- Our Company – Services of Dorsch Consult
- Sustainable Development and Cleaner Production
- Our International Experience
- Focus on Turkey – Initiative

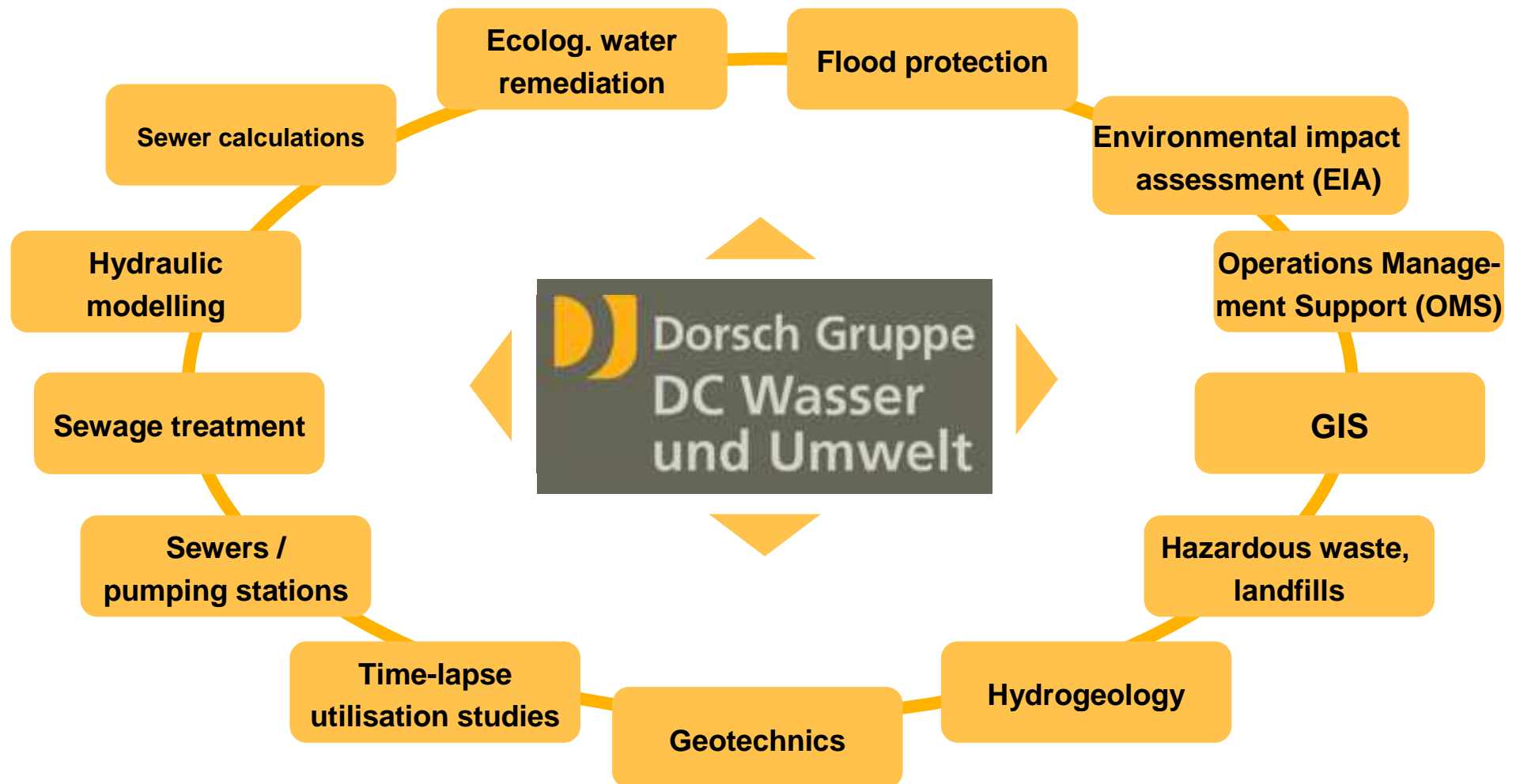
Company Information Dorsch Gruppe

More than	50	Years of Experience
about	1,500	Staff Members
	60 %	Turnover Abroad
about	1,500	Domestic and Overseas Projects per Year
over	140	Countries
over	65	Million € Consulting Fees / Year
over	1.5	Billion € Annual Investments Planned and Supervised

Core Markets – DC Offices / Affiliates Worldwide



Dorsch Services – Multi-disciplinary Projects



Dorsch Experience and Projects in Turkey



Sustainable Development

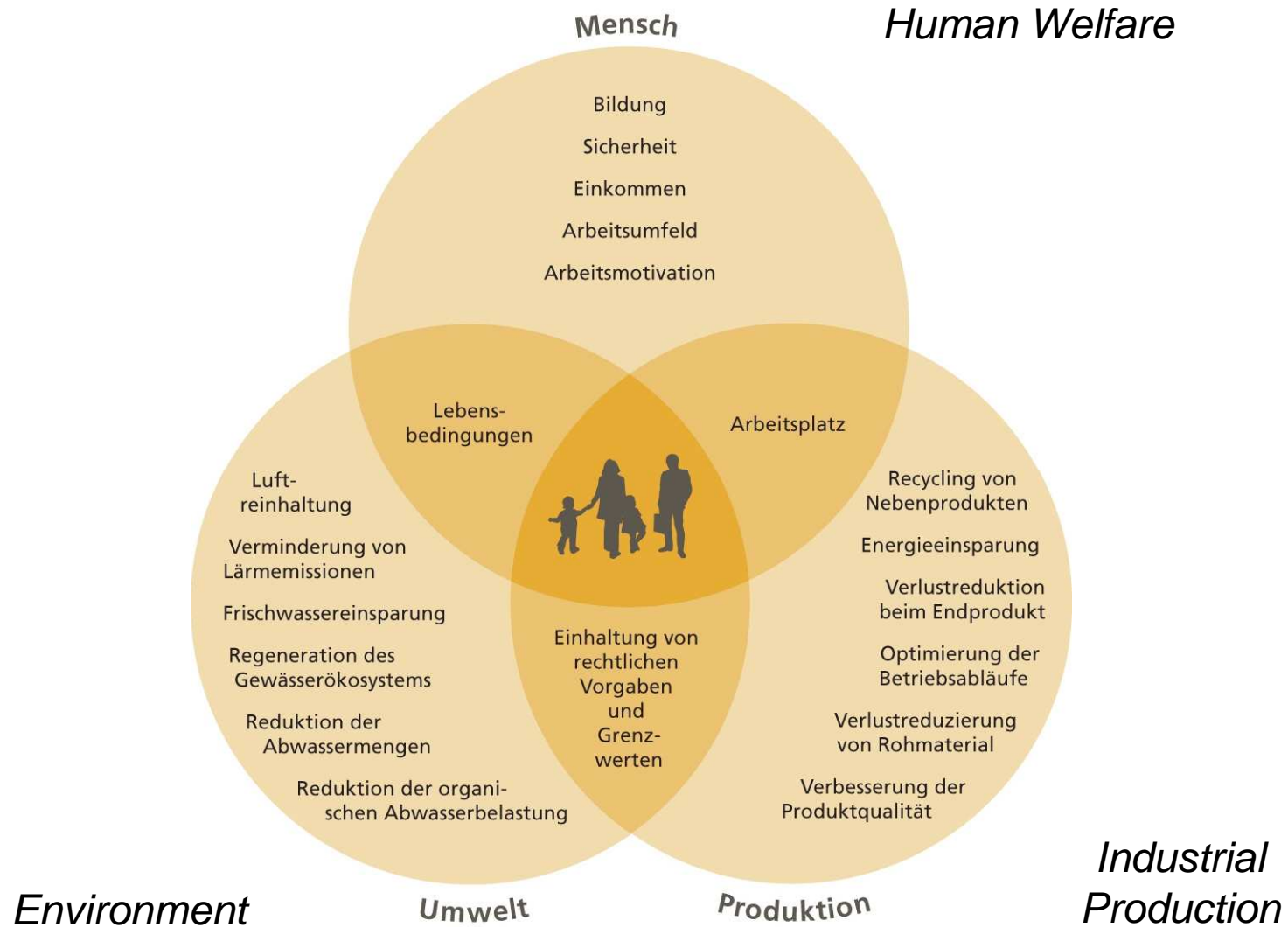
“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Brundtland committee 1987: Report on the state of the environment for the United Nations World Commission on Environment and Development

Sustainable Development and Cleaner Production

- Ignoring the pollution problem – lack of action (until mid of 20th century)
- Dispersion / “solution by dilution” (the 1960s)
- End-of-pipe treatment (the 1970s)
- Recycling and energy recovery (the 1980s)
- Cleaner production and preventive measures (the 1990s)
- Today: Zero emission projects, waste as raw material, waste to energy
- In the future: Dematerialization? Industrial ecology?

The Dorsch Philosophy



Qualities of Cleaner Technologies

	Process integrated	Production integrated	End-of-pipe
Purpose	Prevention of emissions and reduction of products in single processes	Reduction and recovery of emissions Production efficiency	Proper discharge of emissions Compliance with legislation
Realisation	Implementation of optimised processes and equipment	Recycling and reuse of resources, products and emissions	Minimisation of quantity and quality of emissions
Investment	high	low	high
Payback period*	5-10 years	1-2 years	no

* for private sector

Effects of Cleaner Technologies

Process modifications (in plant):

- Minimisation of the energy consumption
- Minimisation of product losses
- Processes with low emissions

Production modifications:

- Reuse of rinsing waters, reuse of chemicals
- Recirculation of cooling waters (closed circles)
- Reuse of energy in installing heat exchangers
- Automation of filling and cleaning processes (CIP)

Specific Solutions depending on:

- The branch of industry
- Environmental standards
- The age of the equipment
- The local situation (is there a municipal treatment plant in the surroundings ?)
- Seasonal variations (e.g. olive oil or wine) of production
- Prices of resources and energy
- Motivation of staff and operators involved in the optimisation process

Advantages for the Client **and** the Environment

- Emissions and discharges in compliance with environmental legislation
=> **Environmental Benefit**
- Saving of energy and resources
=> **Economic Benefit = Mutual Benefit !**
- Improved safety and environmental conditions at work
=> Increased motivation of staff !
=> **Economic Benefit !**
- **Consulting fees can be saved within a short pay-back period !**
- Pay-back period of investments varied

Selected International References of Dorsch Consult

- Facility Programm for Environmental Projects in Public Sector Industries in Egypt



Facility Programme – Facts and Figures

Objectives

- Assisting public sector industries to comply with environmental legislation
- Using Best Available Technologies in order to maximize cost – benefit relation
- Main emphasis was on industrial wastewater discharges (at the beginning)

Investment Funding

- German KfW grant (total) : € 27,000,000, Average grant component: 25 %
Total investments: Approx. € 125,000,000
- At least 30% of the investment must be funded as commercial loans from 5 participating banks, rest from company's own resources or regular loans
- Selection process for eligible companies and projects
– Coordinating Consultant and EEAA (Egyptian Environmental Affairs Agency)

Facility Programme 1997 - 2008



Egyptian Pulp & Paper - Edfu

Dorsch Consult as Coordinating Consultant for

- 50 implemented projects
- 74 (sub-) projects / packages of measures
- in 35 different factories belonging to 25 companies
 - **14 projects in the chemical sector (in 7 factories)**
 - **43 projects in the food sector (in 20 factories)**
 - **4 projects in the mineral and petrochemical sector (in 4 factories)**
 - **13 projects in different industrial sectors (pharmaceutical, textile, other)**

Projects of the Facility Programme

- **38 projects 'Cleaner Production':**

In-plant or in-process modifications with a significant economic benefit

➔ savings of water, energy, raw material, final product



New Cooling Towers at Egyptian Plastics, Alexandria

- **36 projects 'End-of-pipe Treatment':**

Improvement of wastewater quality to comply with discharge limits

➔ only environmental benefit
– additional cost



IWWTP at Nile Oil & Detergents, Mostorod, Cairo

Environmental Benefits – Facts

- Reduction of freshwater consumption (reuse, closed circles)
- Reduction of pollutant loads in the effluent (point-source or end-of-pipe treatment)
- Reduction of wastewater flow discharged to public sewerage or agricultural drain
- Effluents now in compliance with legal limits
- Improvement of working environment
- Improvement of air quality
- Reduction of energy consumption
- Reduction of losses of materials and products



Lead vapor and dust control at Egyptian Plastics, Alexandria



IWWTP at Alex Free Zone, Alexandria

Environmental Benefits - Figures

- Reduction of freshwater consumption:
In 21 factories: About 25,000 m³ / day
- Savings of raw material:
In 9 factories: Recovery of ammonia, HCL and solvents, fiber reuse
- Savings of final products:
In 5 factories: Urea 22,873 t/y, Detergents 600 t/y, Pharma 65 t/y
- Reduction of wastewater treated: In 5 factories
- Improvement of wastewater quality: In 34 factories
- Now more than 8,000,000 PE are in compliance with environmental legislation (discharge limits for public sewerage or agricultural drain)

Economic (Mutual) Benefits – Facts

- Recovery of raw material and recovery of final products
(Ex.: Urea recovery (effluent) at Delta Fertilisers: 22,873 t / y → € 2.2 Mio. / y)
- Reduction of freshwater consumption
(Ex.: Nile Oil & Detergents: 4,301,640 m³/y → € 780.000 / y)
- Reduction of wastewater treated
(Ex.: WWT cost at EMISAL before Epsom Plant: € 23 /t of Sodium Sulphate
→ Now Epsom Salt production: Earnings € 75 / t → Benefit € 98 / t)
- Reduction of energy consumption
- Annual benefit from cleaner production (total): € 8.000.000 / y
- Benefit from water recycling and reduction of consumption: € 3,000,000 / y
- Total benefit: Approx. € 11.250.000 per year

Social Benefits – Facts

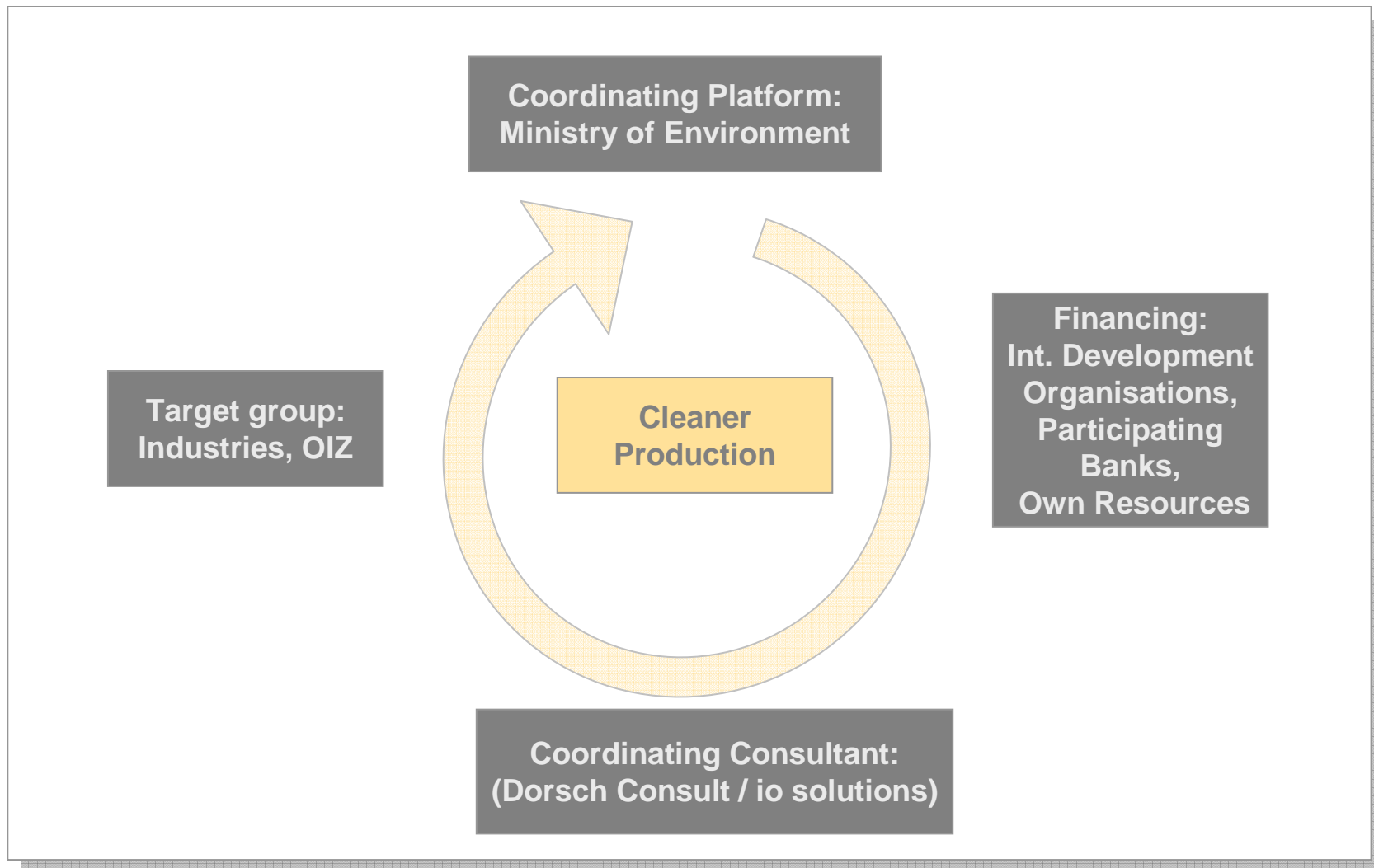
- Creation of new jobs for operating and maintaining the new facilities
- Ensuring long term efficiency of the industries and jobs of the employees
- Improvement of working environment and working conditions
- Improvement of environmental conditions in the neighbourhood
- Improvement of living standards, providing social facilities and education
- Achieving sustainable environmental conditions in the industries
- Compliance with the regulatory environmental limits

Facility Programme - **Lessons learnt**

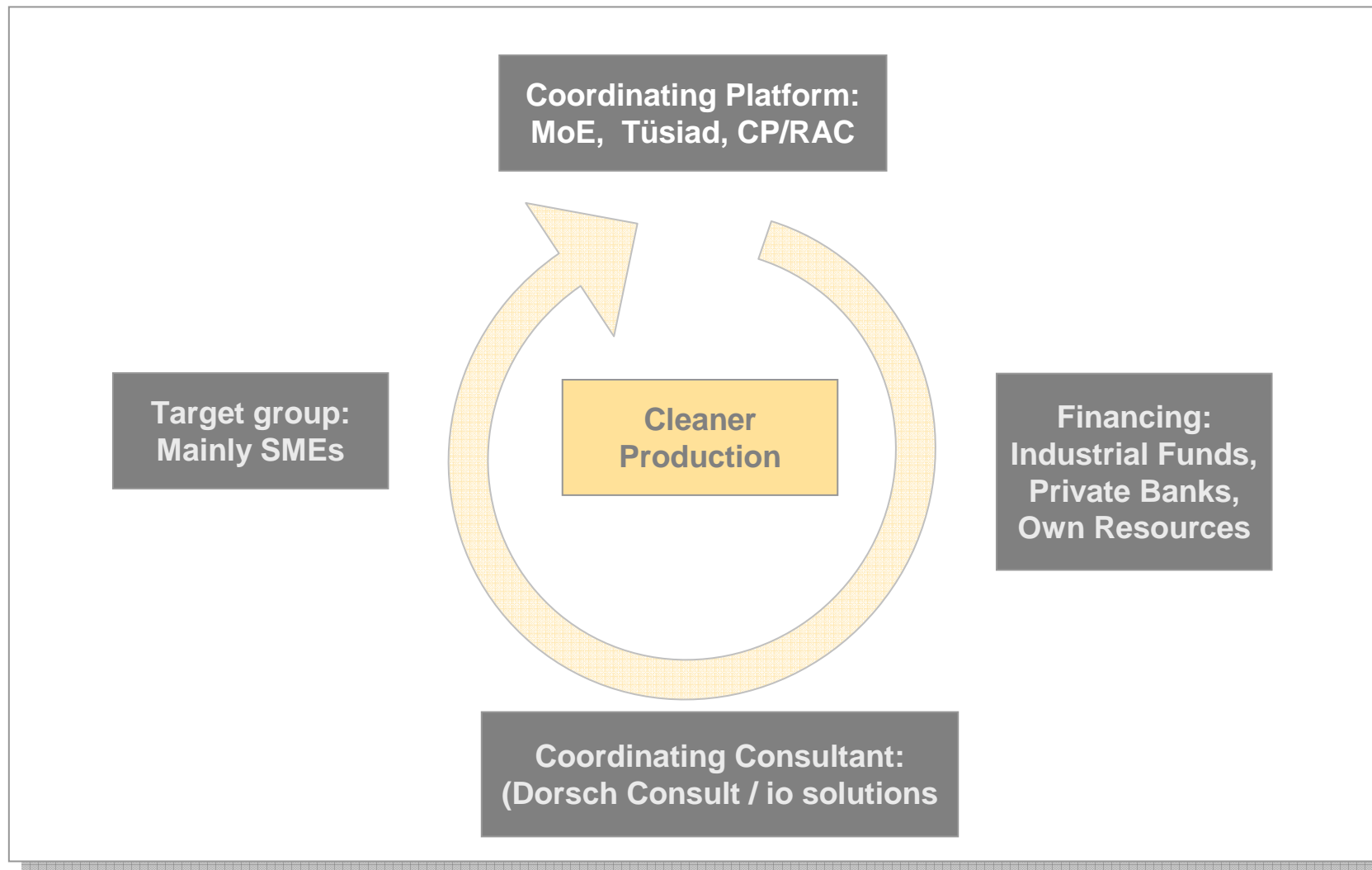


- Industries under economic and market pressures
- Society needs industry **and** sustainable and healthy environment
- Need for continuous environmental monitoring
- Find the industries with environmental projects and commitment
- Focus on **cleaner production** according to economic principles, with environmental benefits:
 - Production efficiency,**
 - Recycling of raw material and final product,**
 - Waste recovery,**
 - Product quality.**
- Over 200 factories with potential projects, 50 implemented (**coordination needed**).

CP Programme in Turkey: Organisational Approach – Public Financing



CP Programme in Turkey: Organisational Approach – Private Financing





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