



INTERNATIONAL GREEN TECHNOLOGIES & INVESTMENTS CENTER



TRANSITION to BAT: CASE of KAZAKHSTAN

Botagoz Ibrayeva, IGTIPC

CONTENT PLAN

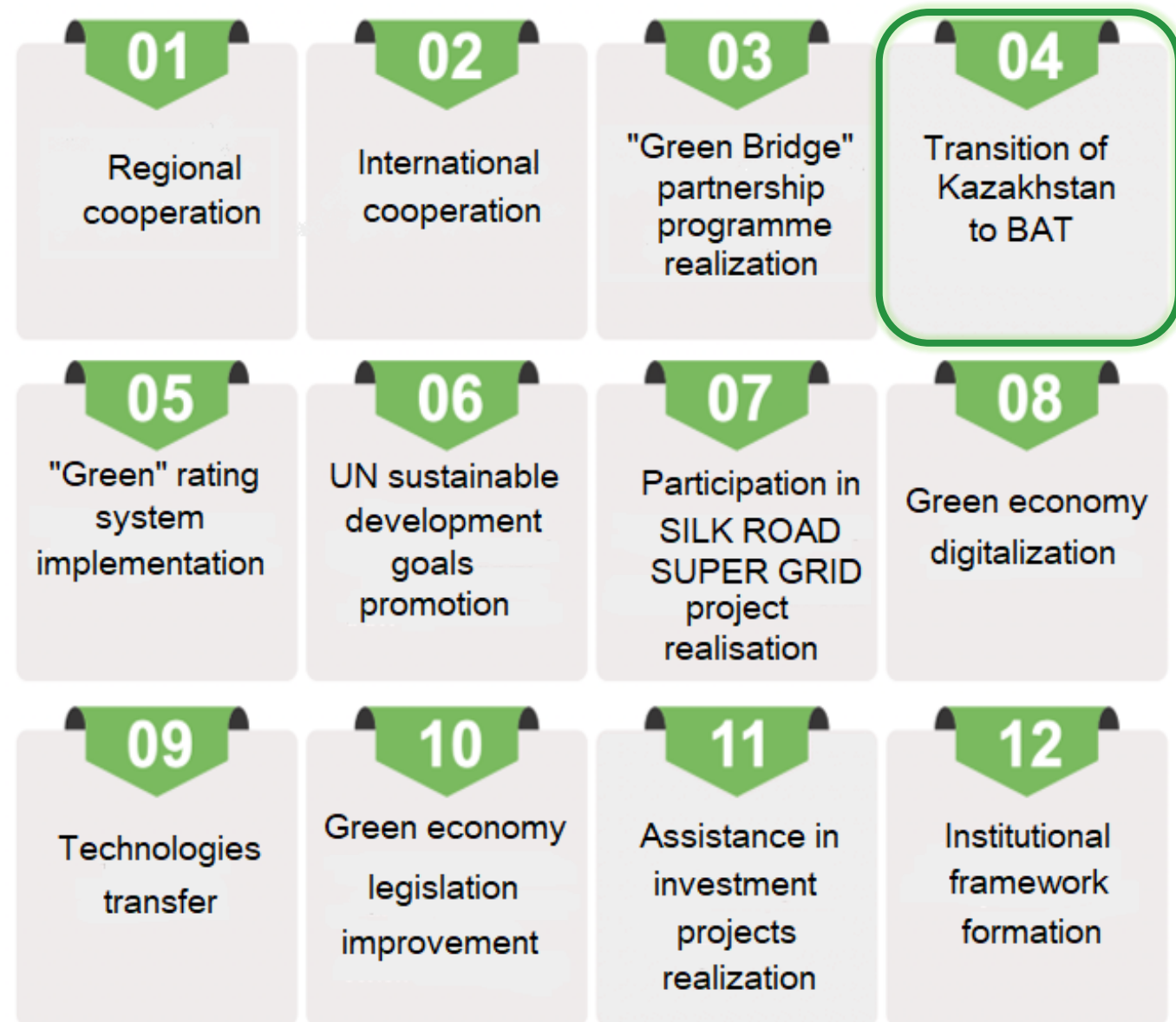
- BAT Bureau of Kazakhstan and its functions
- BAT regulatory and legal framework
- BAT implementation tools in Kazakhstan
- BREFs development and approval procedure
- Current status and BREFs development results
- Key findings of BREF "Cement and lime production"
- Cases of current industry transition to BAT
- International cooperation



About IGTIC

INTERNATIONAL CENTER
FOR GREEN TECHNOLOGIES
AND INVESTMENTS
PROJECTS

BAT BUREAU HAS ITS
LEGAL STATUS BY THE
ARTICLE 113 OF
ENVIRONMENTAL CODE OF
THE REPUBLIC OF
KAZAKHSTAN



BAT regulatory and legal framework

ENVIRONMENTAL CODE OF THE REPUBLIC OF KAZAKHSTAN (as of January 5th, 2021)



BAT integration mechanism

Mandatory **integrated environmental permission** (starting from January, 2025) for 1st category enterprises

«O» **emission payments rate**

otherwise, increase of emission charge rates by 2, 4, 8 times every three years starting from 2028 (from 2025 for the top-50 large enterprises)

Automated **emissions monitoring** system

BAT implementation tools in Kazakhstan

BAT application aims at comprehensive prevention of environmental pollution, minimization and control of negative anthropogenic impact on the environment

The legislation specifies the **threshold values of emissions**, which are mandatory for enterprises to comply with.

If the standards are exceeded over the legally established ones, the natural resource user must have **a plan for achieving the standards**.

- ✓ **Rules** for issuing environmental permits
- ✓ **Rules** for the drawing up, application, monitoring and reviewing of the best available techniques reference documents
- ✓ **Methodology** for expert assessment of industries' technological processes for compliance with the BAT principles



BAT implementation tools in Kazakhstan – BREFs

BREFs are a new conceptual approach to setting **environmental emission standards similar to the European** standardization approach

BREFs define the **conditions for achieving the established values** of the concentrations of pollutants using BAT

BREFs and Conclusions are **established by the Governmental Decree** and **revised every 8 years**







To obtain integrated environmental permit Unit operators are able to refer to OECD BREFs and Conclusions under IPPC Directive

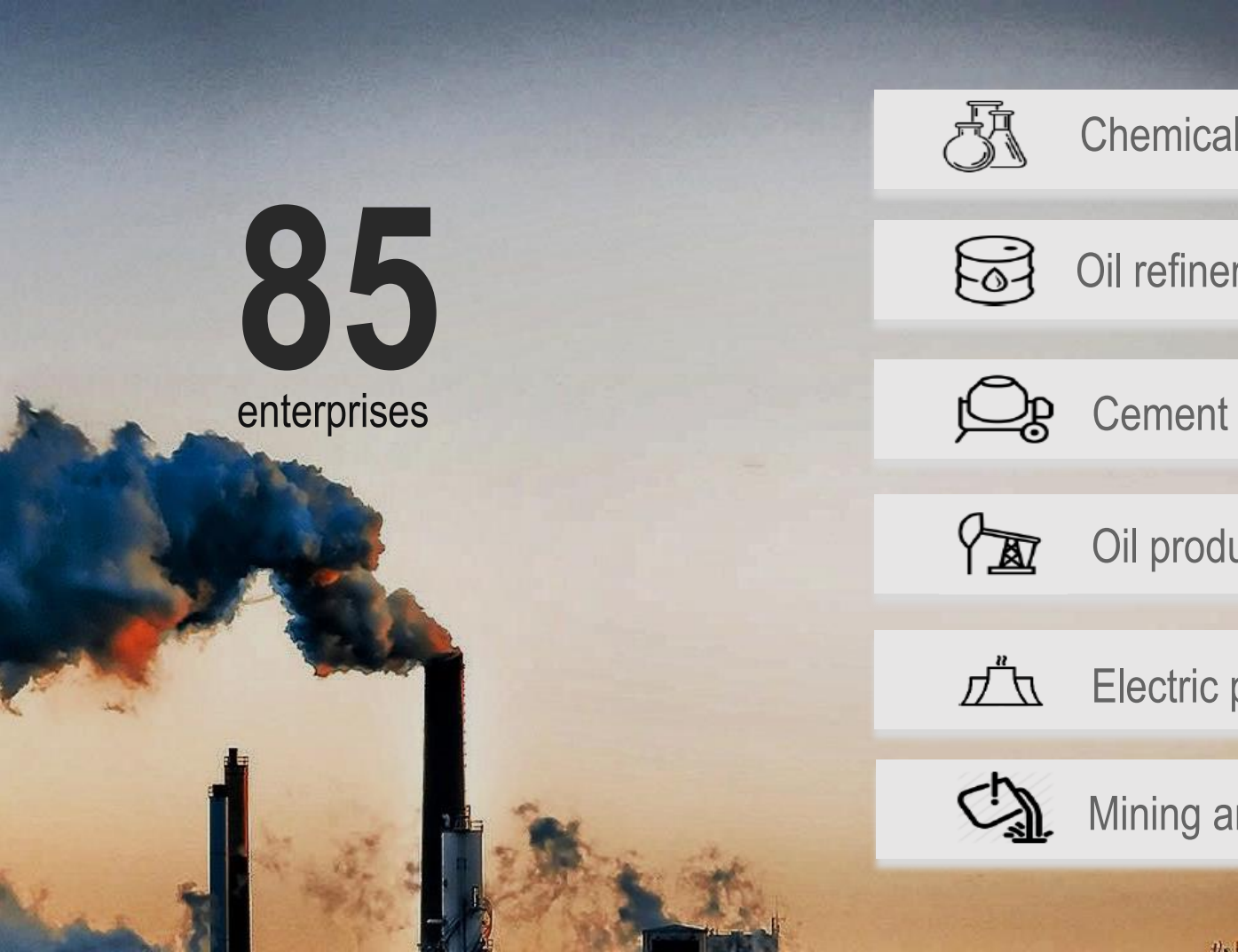


Comprehensive process audit

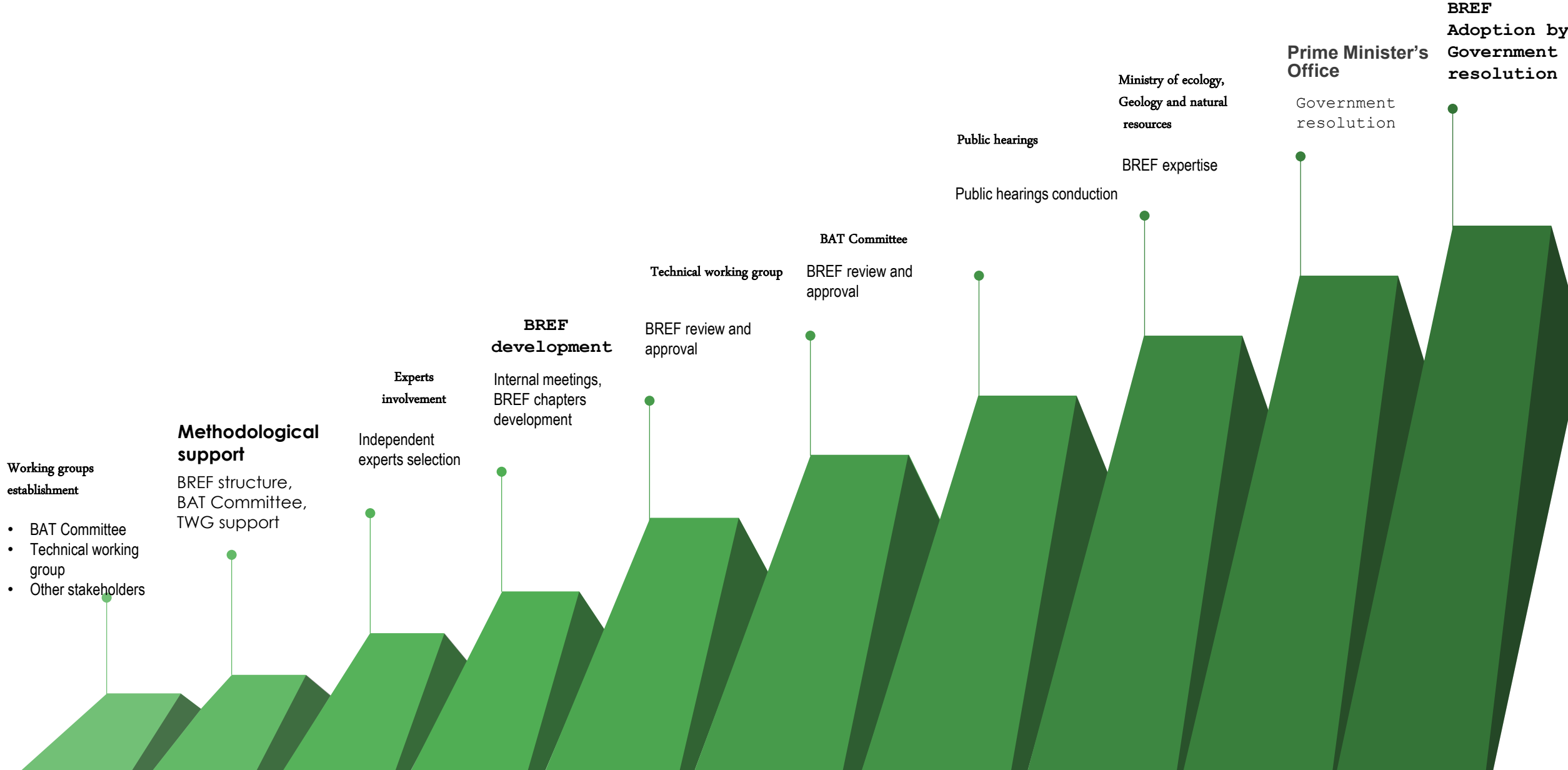
Expert assessment of enterprises technological processes in various industries for compliance with the principles of BAT

85
enterprises

| | | |
|---|--------------------------|-----------|
|  | Chemical industry | 4 |
|  | Oil refinery | 6 |
|  | Cement industry | 10 |
|  | Oil production | 14 |
|  | Electric power industry | 24 |
|  | Mining and metals sector | 27 |



BREFs development and approval procedure



BREFs in Kazakhstan in 2021-2022



Combustion of fuels in large installations for energy production



Oil and gas refinery



Cement and lime production



Inorganic chemicals production

4

Technical working groups

335

experts

20

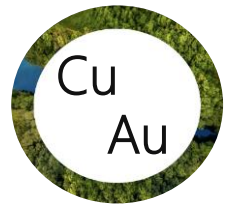
International consultants

30

Technical working groups meetings

- ✓ APPROVED BY TECHNICAL WORKING GROUP
- ✓ REVIEWED BY SCIENCE AND TECHNICAL COUNCIL
- ✓ APPROVED BY BAT COMMITTEE
- ✓ PUBLIC HEARINGS
- ✓ STATE ENVIRONMENTAL EXPERTISE

BREFs in Kazakhstan in 2021-2022



Production of copper and precious metal - gold



Production of zinc and cadmium



Production of lead



Energy efficiency

4

Technical
working groups

90

experts

20

International
consultants

21

Technical
working
groups
meetings



APPROVED BY TECHNICAL
WORKING GROUP



APPROVED BY BAT
COMMITTEE
REVIEW BY SCIENCE AND
TECHNICAL COUNCIL



BREFs in Kazakhstan in 2022-2023



**Ferrous metals mining and
benefication**



**Non-ferrous metals mining and
benefication**



Oil and gas mining



Production of ferroalloys

4

Technical
working groups



**TECHNICAL WORKING
GROUP REVIEW and
APPROVAL**

182

experts



REVIEW BY BAT COMMITTEE

20

International
consultants

23

Technical
working
groups
meetings

Field of application:

1

production of cement clinker in rotary kilns (more than 500 tons per day), or in other furnaces with a production capacity (more than 50 tons per day);

2

lime production in kilns (more than 50 tons per day).



SHYMKENTCEMENT
HEIDELBERGCEMENT Group

STANDAI
CEMENT

BUKHTARMA CEMENT
COMPANY
HEIDELBERGCEMENT Group



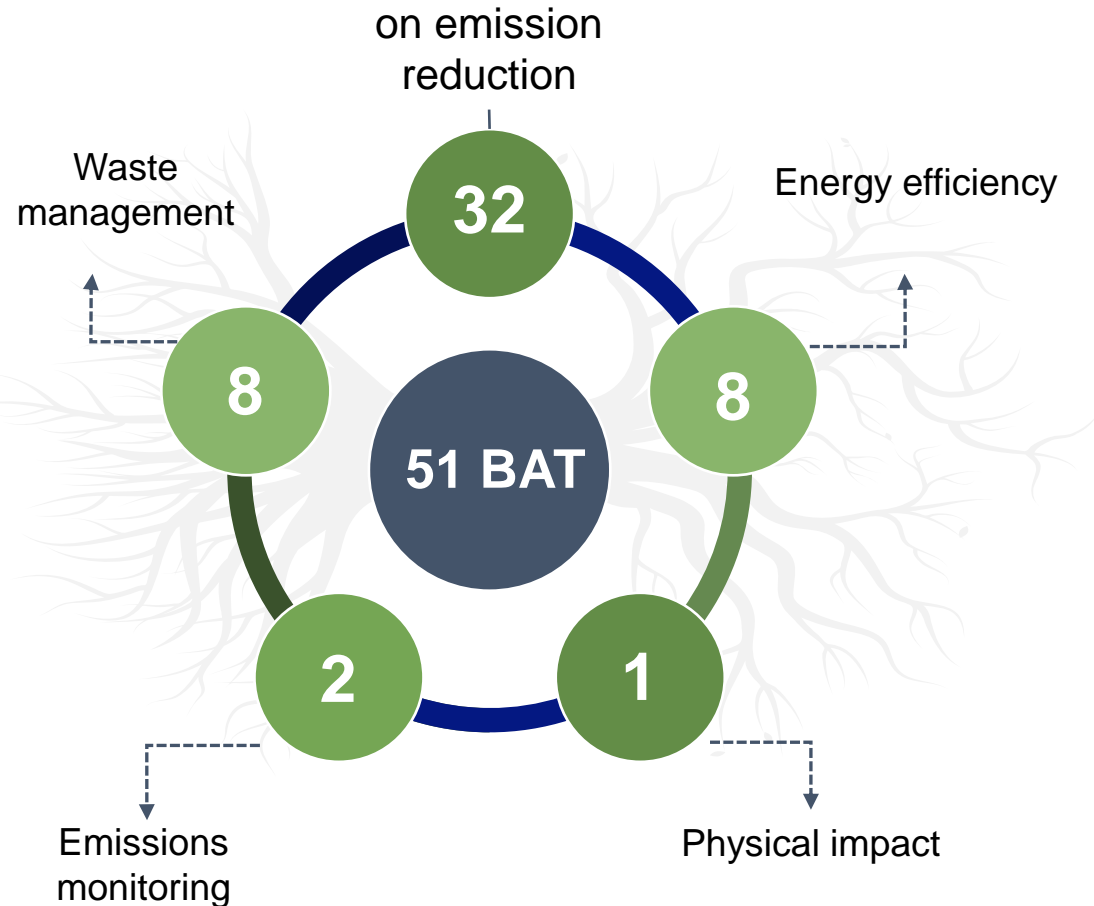
CENTRAL-ASIA-CEMENT



SASTOBE CEMENT

Technological processes:

- Methods of production of cement clinker and lime;
- Storage, preparation and grinding of raw materials;
- Extraction of raw materials;
- Averaging warehouses of raw materials and fuel;
- Grinding of raw materials;
- Averaging and adjustment;
- Preparation and combustion of solid fuel;
- Clinker firing;
- Clinker cooling;
- Clinker warehouses;



179 techniques:

Nox emissions reduction

- SCR
- SNCR
- Use of burners with low Nox formation
- Cooling of the combustion zone
- Step-by-step combustion

SO₂ emissions reduction

- Absorbent additive
- Using a wet scrubber
- Optimization of the raw material grinding process

CO emissions reduction

- Prevention of overshoots of CO
- Continuous automatic CO measurement

Dust emissions reduction

- Bag filters
- Electrofilters
- Hybrid filters

BAT AELs

| Technological proces | Marker substance, mg/nm ³ | BREF KZ | BREF EU | ITS-6 RF, ITS - 7 |
|---|--------------------------------------|----------------|----------|-------------------|
| Wet cement production method | Nox | < 800 | <400-800 | <800 |
| | CO | - | - | <600 |
| | SO ₂ | <400 | <50-400 | <400 |
| | dust | <20 | <10-20 | <25-1000* |
| Dry cement production method | Nox | <400 | <250-400 | <500 |
| | CO | - | - | <600 |
| | SO ₂ | <400 | <50-400 | <400 |
| | dust | <20 | <10-20 | <25-1000* |
| Lime production Parallel flow (PFRK), annular shaft (ASK), mixed feed kiln other shaft kilns (OSK) | Nox | 100-350 | 100-350 | 100-350 |
| | CO | <500 | <500 | <500 |
| | SO ₂ | <50-200 | <50-200 | <50-200 |
| | dust | <10-20 | <10-20 | <10-20 |
| Lime production Long Rotary Kiln (LRK), Kiln with Heat (PRK) | Nox | <200-500 | <200-500 | <200-500 |
| | CO | <500 | <500 | <500 |
| | SO ₂ | <50-400 | <50-400 | <50-400 |
| | dust | <10-20 | <10-20 | <10-20 |

Existing BAT techniques

case of Heidelberg group cement plant



HEIDELBERGCEMENT 

BAG FILTERS INSTALLATION (REDECAM GROUP S.R.L., ITALY) ON CEMENT MILLS, CEMENT SILOS AND ROTARY KILNS (SINCE 2009)

MODERNISATION COST– 488 MLN USD (2,1 billion tenge)

| Dust emissions before | Dust emissions after |
|--------------------------|--------------------------|
| 3219,461 tonnes per year | 1144,169 tonnes per year |

Emissions decrease rate - 64,4%

The enterprise is ready for BAT principles transition and obtain an integrated environmental permit

Wet flue gas cleaning system (BELCO)

Reduced PM and SO_x in cracking emissions with a 98% purification factor

Sulfur production complex (15 000 tonnes per year)

Reduction of SO_x emissions into the atmosphere by 48%

New flare installation with a height of 137 m (the height of the previously operating 42 m)

Increase in the zone of dispersion of pollutants

Installation of clock loading of petroleum products in the commodity and transport department

Reducing emissions of volatile hydrocarbons by 379 tons.

"Closed" type equipment, V-shaped filters, ultrafiltration filters and reverse osmosis unit

Savings in water consumption up to 1.5 million m³ per year

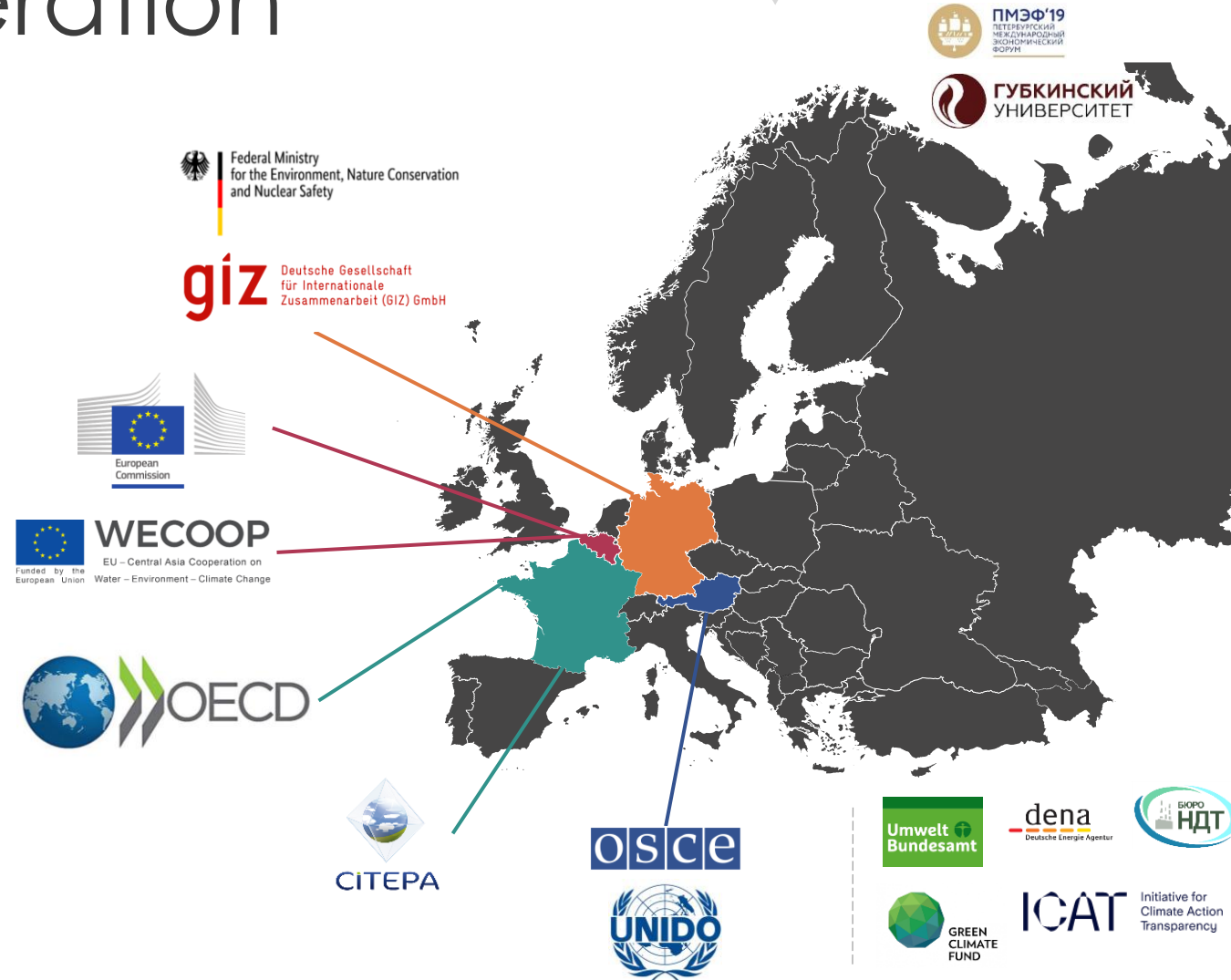


International cooperation

Expert sessions and exchange of experience

BREF development consultation;

Independent assessment and methodological support.





THANK YOU
FOR ATTENTION!

Botagoz Ibrayeva,
BAT Bureau, Kazakhstan

b.ibrayeva@igtipc.org