



Carbon Project and Asset
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Technology and Policy Scoping
for a Low-Carbon Kazakhstan
Cement Industry (TCS ID: 41971)

Policy Roadmap

For a sustainable low-
carbon future of the
Kazakhstan cement
industry

Policy Roadmap: For a sustainable low-carbon future of the Kazakhstan cement industry

For the European Bank for Reconstruction and Development

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Authors:

Jelmer Hoogzaad
Jürgen Wiesmann
Inna Lissova
Michael Clark

Partner organisations:

IETA
WBCSD

Climate Focus
Sarphatikade 13
1017 WV Amsterdam,
The Netherlands



ENECO SOLUTIONS
Energy Ecology Community

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Abbreviations

AB 32	Assembly Bill 32
AIFC	Astana International Financial Centre
APCR	Allowances Price Containment Reserve
BaU	Business as Usual
BMU	German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
CSI	Cement Sustainability Initiative
EBRD	European Bank for Reconstruction and Development
EN	European Norm
EPC	Emissions Performance Credits
ERU	Emission Reduction Unit
ETS	Emission Trading Scheme
EU	European Union
EU ETS	European Emission Trading Scheme
EUR	European Euro
CAD	Canadian Dollar
CANACEM	Cámara Nacional del Cemento, Mexico's national chamber of cement companies
CER	Certified Emission Reduction
CO ₂	Carbon Dioxide, a greenhouse gas
CSCF	Cross-Sectoral Correction Factor
GDP	Gross Domestic Product
GHG	Greenhouse gas
HFC ₂₃	Fluoroform, a greenhouse gas
IETA	International Emissions Trading Association
IFI	International Financial Institutions
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
JI	Joint Implementation
Kaz ETS	Emission Trading Scheme in Kazakhstan
KCCMP	Kazakhstan Climate Change Mitigation Programme
KTZ	Kazakhstan Tenge
MRV	Measurement, Reporting and Verification
NAMA	Nationally Appropriate Mitigation Action
N ₂ O	Nitrous Oxide, a greenhouse gas
NAP	National Allocation Plan
NER	New Entrants Reserve
NO _x	Nitrogen oxides, consist of nitric oxide (NO), nitrogen dioxide (NO ₂) and nitrous oxide (N ₂ O), which can cause acid rain, climate change and smog
OECD	Organisation for Economic Co-operation and Development
PETER	Partnership for Emissions Trading in the EBRD Region
PFC	Perfluorocarbons, a group of greenhouse gasses

Abbreviations

PMR	Partnership for Market Readiness
RDF	Refuse Derived Fuels
SEMARNAT	Secretaría de Medio Ambiente y Recursos Naturales (Mexican state secretariat for environment and natural resources)
SGER	Specified Gas Emitters Regulation
SO _x	Sulphur Oxides, including SO ₂ and SO ₃ which can cause acid rain
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Aid
USD	United States Dollar
WBCSD	World Business Council for Sustainable Development

1.

Summary of Recommendations

The European Bank for Reconstruction and Development (EBRD) has taken the initiative to identify the policy measures which are needed to secure a low-carbon future for the cement industry in Kazakhstan.

This carbon market development project is under the EBRD's Carbon Asset and Project Development Facility and funded by the Bank's Special Shareholder Fund.

This Policy Roadmap builds on experience with climate policies for the cement industry in other countries, consultations with experts and stakeholders and a workshop held in Astana in November 2015 and June 2016. In parallel a Technology Roadmap is developed which identifies the technological investments that are needed to reduce emissions in different scenarios.

The detailed Policy Roadmap with a timeline and overview of the institutions involved, is presented in chapter 6. In 2018, the compliance mechanisms of the emission trading scheme in Kazakhstan (Kaz ETS) is scheduled to enter back into force, whilst in the meantime the Ecological Code and its by-laws will be changed. The proposed policy reforms are assumed to be implemented in the years prior to 2018.

1. Align the ambition level of the Kaz ETS with the international commitments under Paris Agreement on greenhouse gas emission reductions and the related national ambitions on energy efficiency and renewable energy.
2. Move from grandfathering to benchmarking as the underlying principle for allocation of allowances to the cement sector. Differentiating between wet and one for dry cement production can allow for a period of several years in which wet cement production is phased out. By issuing only a share of the allowances for free, part of the allocation can be based on auctioning. This would encourage trade of allowances.
3. This trade can be facilitated by making transactions easier, allowing for banking between years and removing provisions which allow the government to claim allowances back from ETS participants.
4. Review the Ecological Code and its by-laws for consistency, provide clarity on the procedures for applying for allowances from the New Entrants Reserve and the issuance of compliance instruments based on verified emission reductions from domestic projects. Revisions of the Ecological Code can include an effort to align the ETS design with the EU ETS, to facilitate future linking.
5. Revise building standards to allow, and encourage, clinker substitution by the market

Summary of Recommendations

6. Encourage energy efficiency measures to anticipate higher energy prices
7. Clarify and regulate the conditions under which co-combustion of waste in cement kilns can be allowed, and exempt the organic part in this waste from the ETS (subject to robust MRV).
8. Auctioning revenues can be used to co-finance the investments that are needed for low-carbon development of the cement sector.
9. Finally, environmental inspectors and experts can be further trained in identifying emission reduction opportunities and in operating the Measurement, Reporting and Verification (MRV) cycle in a predictable and reliable manner.

2.

Introduction

2.1 Low-carbon cement

Kazakhstan is the largest emitter of greenhouse gases in Central Asia and twice as energy intensive per unit of Gross Domestic Product (GDP) as the average Organisation for Economic Co-operation and Development (OECD) economy. The Government of Kazakhstan expressed its ambition to reduce its greenhouse gas emissions, while supporting the anticipated growth in GDP.¹ To the United Nations Framework Convention on Climate Change (UNFCCC) it expressed the commitment to reduce its emissions by 15% below the 1990 level by 2020.²

The growth rate of the construction sector of Kazakhstan is forecast to have been 3.7% in 2015, then gradually increasing to 5.2% in 2016 and on to 6.3% in 2022.³ The construction sector in Kazakhstan is one of the sectors whose expected growth rate is expected to outpace the country's forecasted GDP growth. That growth was expected to be 2.5% and 3.0% per year in 2016 and 2017 when the forecasts for the construction sector were made.⁴ In April 2016 the World Bank published a more conservative GDP forecast of 0.1% for 2016, 1.9% for 2017 and 3.7% for 2018.⁵ This indicates that the impact of the recent depreciation of the Kazakhstan Tenge and decreasing oil prices are temporary. Although they might affect the growth of the construction sector in the period up to 2017, in 2018 the sector might see growth rates again which exceed the levels of the earlier sector forecasts.

The cement sector has a combination of Soviet-era and new, state-of-the-art plants. The ownership of the cement companies is private, with some plants being partly owned by international companies. For the sector as a whole, there is significant potential to improve efficiency, providing room for a reduction in greenhouse gas (GHG) emissions at constant or even increased production levels.

There is a strong rationale for emissions trading. The marginal carbon reduction costs are expected to differ substantially. With trading, the costs of compliance can be reduced for the whole sector.

¹ Concept for transition of the Republic of Kazakhstan to Green Economy, Astana 2013, Approved by the President of the Republic of Kazakhstan approved on May 30, 2013 #557. This ambition is also expressed in the submission to the UNFCCC, which states that "The Government of the Republic of Kazakhstan accepted voluntary commitments to reduce greenhouse gas emissions by 15% in 2020 and by 25% in 2050 as compared to the level of 1992." (Additional information relating to the quantified economy-wide emission reduction targets contained in document FCCC/SB/2011/INF.1/Rev.1 (Bonn, 2012).

² Ministry of Environmental Protection, Appendix I - Quantified economy-wide emissions targets for 2020, (Astana, 2010), [download](#).

³ Terry Pavlopoulos, Kazakhstan Cement Industry – A market due diligence, April 2014.

⁴ Carbon Limits AS, Mitigation projections for Kazakhstan – EBRD Support to Kazakhstan's Intended Nationally Determined Contribution and Long-Term Carbon Budgets for the Kaz ETS (Oslo, 2015, draft)

⁵ World Bank, The impact of China on Europe and Central Asia, April 2016, page 90.

The European Bank for Reconstruction and Development (EBRD) has taken the initiative under its carbon market development support to identify the policy and technology actions which are needed to secure a low-carbon future for the cement industry in Kazakhstan.

The project aims to support the Kazakhstan Association of Cement and Concrete Producers (“Cement Association”) in particular, and the cement sector in Kazakhstan in general, in its policy dialogue with the government. The EBRD has mandated a consortium of Climate Focus, Greenstream, Whitehopleman and Eneco Solutions (“the Consortium”) to identify the policy and technology actions which are needed to secure a low-carbon future for the cement industry in Kazakhstan. This work is being carried out in close partnership with the International Emissions Trading Association (IETA) and the World Business Council for Sustainable Development (WBCSD). Both organisations have been consulted throughout the project.

This document describes a policy roadmap for low-carbon development of the cement sector in Kazakhstan. The policy roadmap is based on intensive consultation with experts and stakeholders, including stakeholder workshops on 24 November 2015 and 30 June 2016 in Astana, in which the majority of cement companies in Kazakhstan were represented.

This Policy Roadmap is complemented by a separate Technology Roadmap, which describes low-carbon development scenarios for the cement sector in Kazakhstan. The Technology Roadmap goes into more detail on the historical emissions and future emission scenarios, looking at what different kinds of mitigation actions (energy efficiency, clinker substitution, alternative fuels, fuel switch) can contribute towards GHG emission reduction at plant and sector level. The scenarios should minimize abatement costs and avoid undue burdens in terms of investment costs or loss of international competitiveness.

2.2 Policy principles

The policy dialogue between the cement industry, the Cement Association as representative organisation, and the Government of Kazakhstan should be guided by a set of policy principles. The principles should help determine the common interest between government and the cement sector, while ensuring that the cement sector can further reduce its carbon footprint.

The representative organisation of the European cement industry, CemBureau, has published several position papers on draft legislation from the European Commission. A review of the arguments which CemBureau uses in this policy dialogue, provides insight in the principles which the CemBureau applies and which can also guide the dialogue between the Kazakh Cement Association and the Government of Kazakhstan. Similarly, publications from IETA and the WBCSD have been analyzed to also identify their underlying policy principles.

These principles have been presented to stakeholders from the cement sector in Kazakhstan and, with their support, adjusted to the specific context of this country. The result is that the climate policies which target the cement industry in Kazakhstan should:

1. be coherent, predictable and stable in the short and long run,
2. provide incentives based on objective greenhouse gas emission data and consider real or recent production levels,

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3. create fair incentives for a reduction of greenhouse gas emissions that is both ambitious and technically and economically realistic,
4. not distort the domestic and international competitive level-playing field of the cement industry in Kazakhstan, considering both the cement market as well as the broader markets for raw materials and fuels, (e.g. avoid leakage, a situation where emissions shift to industries for similar products outside Kazakhstan whose greenhouse gas emissions are not, or less stringently, regulated, and by importing would relatively increase global emissions).
5. Gradually remove barriers to investments in low-carbon development (including energy efficiency, clinker and fuel substitution) for example, energy subsidies and limited access to financing,
6. safeguard environmental integrity, (e.g. policies should aim for a decrease in greenhouse gas emissions while avoiding an increase in the emission of other pollutants to air, water and soil),
7. enhance the public awareness and train policy-makers on industrial symbiosis and recycling.⁶

These seven policy principles have been used to identify which policy reforms the Cement Association should pursue in its dialogue with the Government of Kazakhstan.

2.3 Content of the report

This report describes the policy roadmap and the four steps which were taken for its formulation.

The third chapter describes the existing legislation and government programmes in Kazakhstan which regulate and affect greenhouse gas emissions from cement production. This chapter describes the Emission Trading Scheme in Kazakhstan (Kaz ETS) which aims to reduce the greenhouse gas emissions from large emitters, including cement plants. Since the Kaz ETS directly targets greenhouse gas emissions, this regulatory instrument has been analysed in most detail.

The fourth chapter describes policy best practices in jurisdictions other than Kazakhstan. This section builds on the earlier work done by the World Bank under the Partnership for Market Readiness (PMR)⁷. The policy instruments identified include:

⁶ These policy principles have been extracted from publications from CEMBUREAU, the representative organization of the cement industry in Europe, and from the WBCSD, notably:
 CEMBUREAU, Consultation on revision of the EU Emission Trading System (EU ETS) Directive post-2020, 16 March 2015, [download](#)
 CEMBUREAU, Consultation on the Effort Sharing Decision, 19 June 2015, [download](#)
 CEMBUREAU, Position paper on carbon leakage, (2014) [download](#)
 WBCSD/IEA, Cement Technology Roadmap 2009 – Carbon emission reductions up to 2050, (2009) [download](#)
 WBCSD/IEA, Technology Roadmap – Low-Carbon Technology for the Indian Cement Industry (2013), [download](#)
 Alliance of Energy Intensive Industries, Strategic choices for ETS post-2020: allow energy intensive industries to be competitive and grow in Europe, (2015), [download](#)
 IETA, Position Paper: Overlapping Policies with the EU ETS (July 2015), [download](#)
 IETA, Position Paper: The Market Stability Reserve: where are we with the reform of the EU ETS? , [download](#)
 IETA, Position Paper: Carbon Pricing Priorities for the Paris 2015 agreement, [download](#)
 IETA, Position Paper: IETA's Views on International Credits in the EU (February 2015), [download](#)
 IETA, Letter to Commissioner Connie Hedegaard Regarding Single Process Auctioning (2010) , [download](#)

⁷ For further information: www.thepmr.org

- a) Emission Trading Schemes, with the European ETS (EU ETS) as a prominent example,
- b) CO₂ or energy taxation,
- c) laws and regulations on co-combusting waste,
- d) laws and regulations on clinker substitution (e.g. quality standards for cement),
- e) laws and regulations on energy efficiency.

This section also reflects upon the policy coherence between these different instruments, and whether they provide a strong and clear incentive for low-carbon development.

The fifth chapter presents a gap analysis. This analysis compares international policy best practices for a low-carbon cement industry with the policies in place and proposed in Kazakhstan. The Kaz ETS has a prominent place in this analysis, as it is a key policy instrument to reduce industrial greenhouse gas emissions.

The sixth chapter translates the findings from the gap analysis into a policy roadmap which is in line with the policy principles. The roadmap places the proposed policy interventions for a low-carbon and sustainable cement industry in a timeline. It also allocates responsibilities to specific institutions and identifies roles for International Financial Institutions (IFIs) to aid the successful implementation of the roadmap.

3.

Regulatory Framework in Kazakhstan

The emission trading scheme is at the centre of Kazakh climate policies, supported by policies on energy efficiency and green economic development.

The current regulatory framework for the greenhouse gas emissions from the cement sector is undergoing reform. Apart from existing regulations, several strategy documents on green economy and national development will help shape future legislation. This chapter looks at both levels, and describes the position of the Government of Kazakhstan on:

1. greenhouse gas emissions, notably the Kaz ETS and the allocation principles applied,
2. the use of alternative fuels, including Refuse Derived Fuels (RDF) and biomass,
3. clinker substitution,
4. energy pricing and energy efficiency.

3.1 Green Economy and Strategy 2050

The Concept for Transition of the Republic of Kazakhstan to Green Economy (the “Green Economy Concept”), approved in 2013, defines economy-wide targets for energy use and GHG emissions. On the energy efficiency of the national economy, the concept aims to reduce energy consumption per unit of GDP by 10% in 2015, 25% in 2020 and 30% in 2030 compared to the 2008 level.⁸ For the power sector the concept describes a 50% share of alternative and renewable energy by 2050. In addition, the concept announces more stringent emission standards for particulate matter, SO₂, NO_x from industry, while leaving open what emission limits will be proposed.

The concept also anticipates expanding construction activity, expecting that 55% of the building stock and 40% of the power plants in 2030 will be newly built “green-field construction”. This construction activity is likely to increase cement demand, although this is not articulated in the concept.

To incentivise energy efficiency measures in industry, the Green Economy Concept proposes to conduct regular audits to assess compliance with energy efficiency targets and energy consumption standards for new equipment as set by Gosstandard.⁹ It also proposes a revision of the electricity and heat tariffs and support measures for industry to safeguard

⁸ Concept for transition of the Republic of Kazakhstan to Green Economy, Astana 2013, Approved by the President of the Republic of Kazakhstan approved on May 30, 2013 #557.

⁹ Further information can be obtained from Gosstandard: www.memst.kz

their competitiveness during the transition period. In addition, it states that energy prices and tariffs are often insufficient to either maintain energy infrastructure or incentivise energy efficiency measures by industry. The Concept proposes fair tariff and price setting for resources such as water, land and energy to avoid subsidising their consumption, while encouraging fuel switch to natural gas in transport and combined heat and power stations.

The Strategy 2050 aims to secure economic growth based on the efficient management of natural resources, both raw materials and energy resources. In line with the Green Economy Concept, the stated objective of the Strategy 2050 is to cover 50% of the national energy consumption with renewables by 2050.¹⁰ In 2012 the share of renewable energy in the total energy consumption of the country stood at around 1.7%.¹¹

3.2 International Climate Commitments and Non-State Stakeholders

In September 2015¹² Kazakhstan submitted its Intended Nationally Determined Contribution (INDC) to the UNFCCC. INDCs are the primary means for governments to communicate to the international climate negotiations, the steps that they will take nationally to address climate change. In its INDC Kazakhstan committed to reducing its GHG emissions by 15% by 2030 compared to the level in 1990. When Kazakhstan can benefit from international investments, access to low carbon technologies transfer mechanisms, the Green Climate Fund and market-based mechanisms it can increase its reduction ambition to 25%. Per an analysis by Carbon Limits, the abatement potential of CO₂ emissions from the ETS sector amounts to 27% by 2030.¹³

The climate conference in Paris in November 2015 has produced a landmark agreement in which 195 countries committed to keep global greenhouse gas emissions at a level which would limit global warming to 2 °C degrees by 2100, with the intention to stay even below 1.5 °C.

To reach the 1.5 °C ambition it is estimated that annual global greenhouse gas emissions need to be reduced with 26 billion tonnes CO₂e in 2030, a 40% reduction below the emission levels of a BaU scenario. The United Nations Environment Programme (UNEP) estimated that if all policies and measures proposed by the countries that participated in the negotiations are successfully implemented, they deliver about half of the reductions needed by 2030. To develop also the remaining emission reductions, the Paris Agreement includes a process to review every five years the GHG emission levels, and mitigation ambitions, and invite countries to increase their national ambitions, if necessary.

The Paris Agreement is expected to enter into force on the 4th of November 2016, as sufficient parties have ratified the agreement.

¹⁰ Address by the President of the Republic of Kazakhstan, Leader of the Nation, N.A.Nazarbayev, Strategy "Kazakhstan-2050". New political course of the established state. Further information on both the Green Energy Concept of Kazakhstan and the Strategy 2050, [download](#).

¹¹ Calculations based on IEA, Kazakhstan: balances for 2012, in which the energy obtained from water and wind power as well as biofuels was divided by the total final consumption of energy. The 2012 energy balances for Kazakhstan showed no use of waste as energy source of solar or geothermal energy sources.

¹² UNFCCC Newsroom, Kazakhstan Submits its Climate Action Plan Ahead of 2015 Paris Agreement, (Bonn, 2015) [download](#).

¹³ Carbon Limits, Mitigation projections for Kazakhstan, EBRD Support to Kazakhstan's Intended Nationally Determined Contribution and Long-Term Carbon Budgets for the Kazakh ETS (Oslo, 2015).

Representatives from the worldwide cement industry committed to reduce their emissions by 20% to 25% by 2030 compared to the Business as Usual scenario. This would reduce emissions by about 1 Gtonne CO_{2e}. This ambition was presented by the Cement Sustainability Initiative (CSI) of the World Business Council for Sustainable Development (WBCSD) at the UNFCCC climate negotiations in Paris in December 2015. 16 cement companies are members of CSI. One of the members, HeidelbergCement (including Italcementi Group) has three cement plants in Kazakhstan.¹⁴

3.3 The Kaz ETS

The Kaz ETS is the main regulatory instrument targeting GHG emissions, including those from the cement sector. The ETS caps the total emissions from participating companies by an allocation of tradable emission allowances per company. An allowance is a title to emit 1 tonne of CO_{2e}. The trading scheme completed its pilot compliance period (2013) and its Phase II compliance period (2014-2015).

Table 1: Phase III allocation of allowances in the ETS of Kazakhstan covering 2016-2020.¹⁵

Sector	Number of participating companies	Quota allocation for 2016-2020 (tonne CO ₂)
Energy	52	471,225,485
Oil, gas and coal extraction	44	83,355,877
Industry	43	191,932,522
... of which cement	9	29,625,664
Total allocation	139	746,513,884
New entrants reserve		21,946,508

The Kazakhstan ETS has been suspended till 1 January 2018. The latest National Allocation Plan (NAP) is the version which was prepared for the period 2016-2020, prior to the decision to suspend the ETS. This NAP covers 139 companies (Table 1). The free allocation of 746 million allowances is based on the average emissions from the years 2013 and 2014. The national reserve of close to 22 million allowances is based on forecasted GDP growth. These figures might have to be revised in the light of the lower growth forecasts from the World Bank for the period 2016 till 2018.¹⁶

For Phase III which will commence in 2018,¹⁷ the ETS is undergoing reform, of which the legislative part is expected to be finalised in 2016. Thus, the NAP for the period after 2018 can allow the use of benchmarking.

In the period up to 2018, companies that are participating in the Kaz ETS will have to continue reporting on their emissions and have these reports verified by accredited independent third parties. There will be no penalties for non-compliance with the NAP, nor will there be trading of allowances. The compliance mechanism might enter back into force in 2018. In the meantime, the methodologies and regulatory framework of the Kaz ETS will be subject to reform, including the allocation for the years from 2018 onwards. From 2018 onwards companies should report and verify their emissions based on ISO 14065, the international standard which specifies

¹⁴ WBCSD, Cement industry calls for long-term policy certainty as it aspires to reduce CO₂ emissions by 20-25% by 2030, (2015), [download](#).

¹⁵ National Allocation Plan for 2016-2020, submitted on 3 November 2015 for approval by the parliament.

¹⁶ World Bank, The impact of China on Europe and Central Asia, April 2016, page 90.

¹⁷ IETA, Kazakhstan - The World's Carbon Markets: A Case Study Guide to Emissions Trading (Last Updated: May 2015), [download](#).

Regulatory Framework in Kazakhstan

principles and requirements for bodies that undertake validation or verification of greenhouse gas assertions.¹⁸

Table 2: Cement companies and plants in Kazakhstan.¹⁹

Company	Plants	References in the NAP Phase II (2014-2015)	2014 allocation	2016-20 annual allocation
Heidelberg	Vostok Cement	АО Бухтарминская цементная компания	1,187,430	1,303,105
	Caspi Cement	(not in the NAP)		
Italcementi	Shymkent Cement	АО Шымкентцемент	516,671	556,927
Kazakh	Sastobe Cement	ТОО «SasTobeTechnologies»	464,329	330,583
	Kazakh Cement	ТОО КазахЦемент	28,802	437,330
Standard	Standard Cement	ТОО СтандартЦемент	642,766	604,499
Steppe	Central Asia Cement	АО CentralAsiaCement	676,800	603,680
	KarCement	АО Карцемент	553,317	587,266
UGC	Semey Cement	ТОО Цементный завод Семей	1,015,309	962,128
Vicat	Zhambyl Cement	ТОО Жамбылская цементная производственная компания	795,194	712,664
Total			5,880,618	5,925,133

Note: The allocation for 2014 is 100% of the average emissions in the years 2011 and 2012. The provisional annual allocation for 2016 to 2020 is based on 100% of the average emissions in the years 2013 and 2014.

Out of the 166 companies participating in the second phase of the Kaz ETS, ten companies are producing cement. With an aggregated emission level of 5.8 Mt CO₂, the cement sector represents about 3.5% of the total number of allocated allowances (Table 1). Table 2 provides an overview of the cement companies in Kazakhstan which are participating in the Kaz ETS. The allocation for the Phases I and II has been based on historic emissions, an approach also referred to as grandfathering. The allocation plan for Phase III is also based on grandfathering but legal reforms may allow for an amended allocation for the years from 2018 onwards.

GHG emissions from cement production stem from the combustion of fuels and the chemical decomposition of limestone in the kilns. The latter is referred to as 'process emissions'. The quota allocation to these companies covers both the combustion emissions and the process emissions.

The total cement production capacity installed in 2015 was 12.3 Mt/year. Capacity expansion and the construction of new cement plants are expected to increase capacity to 15.5 Mt/year by 2018.

The power, coal mining and oil and gas sectors make up about 75% of the allocation and developments in these sectors will have a large impact on the future price of allowances. According to the Green Economy Concept, the future emissions from these sectors are highly dependent on future prices for hydrocarbons. At low gas prices, power production may shift from coal to gas, which could reduce emissions. At high oil and gas prices in the future, the production and export of oil and gas from Kazakhstan is expected to reach its maximum level in 2030 to 2040, which is likely to increase emissions.

¹⁸ Findings from the workshop at 30 November 2015 in Astana.

¹⁹ National Allocation Plan for 2014-2015, approved on 31 December 2013, № 1536 National Allocation Plan for 2016-2020, submitted on 3 November 2015 and subject to approval.

The Kaz ETS allows for the use of carbon credits from emission reduction projects in sectors which are not covered by the ETS. The Government of Kazakhstan identified the following priority sectors for the development of these domestic offset projects: mining and metallurgy (non-CO₂ gases), agriculture, housing, forestry, prevention of land degradation, renewables, municipal and industrial waste, transport and energy efficient construction. The development of domestic offset projects is interesting if the costs of generating carbon offsets are lower than the price of allowances under the ETS, or the costs of investments by cement plants in reducing their greenhouse gas emissions.

Box 1: Entities involved in Kaz ETS operation

The main entities which are involved in developing and operating the ETS are:

1. The Ministry of Energy, Climate Change Department: Government body responsible for the ETS and its regulatory framework and focal point for the United Nations Framework Convention on Climate Change (UNFCCC).
2. JSC Zhasyl Damu: The, de facto, national ETS administrator, which to date has led the design and coordination of the Kaz ETS. Responsibilities include developing the National Allocation Plan (NAP) which lists how many emission allowances will be allocated to companies that are participating in the ETS, developing the legal framework and the technical infrastructure for GHG data collection and the registry. However, Zhasyl Damu does not have regulatory authority and cannot issue penalties.
3. Committee of Ecological Regulation and Control: Government body which issues the emission allowances, analyses the compliance of all ETS participants on 8 August each year after the end of a compliance period.
4. "Caspian" Commodity Exchange, which facilitates trade of allowances among participants in the Kaz ETS.

3.4 Energy policies

Some of the ideas put forward in the Green Economy Concept have been implemented in the 2014 revisions of the Law on energy saving and increase of energy efficiency.²⁰ The main provisions with relevance for industry, are:

- Legal entities which consume primary energy resources equivalent to over 1,500 tons of oil equivalent per year, need to be included in a State Energy Register. This includes all cement plants listed in Table 2.
- Companies listed in the State Energy Register need to implement an energy management system in compliance with ISO 50001, the international standard on energy management.²¹ They are also subject to an energy audit by an accredited auditor once every five years. Companies should have completed an energy audit within three years of the Law coming into effect. Since the law entered into

²⁰ Ministry of Energy, Law on Energy Saving and Increase of Energy Efficiency, adopted in January 2013, and revised in January 2014, of which some revisions entered into force in January 2015.

²¹ Further information on ISO 50001 can be obtained at the web-site of the International Organization for Standardization: <http://www.iso.org/iso/home/standards/management-standards/iso50001.htm>.

force in January 2012, all companies should have completed their first energy audit by January 2015.²²

- The conclusions of the audit will be recorded in the State Energy Register, together with the energy consumption of the company and energy saving action plans.
- Energy consumption metering should be installed in all new plants and buildings.
- For existing installations, tariff differentiation can be applied to incentivise the installation of meters.
- The construction of new, and refurbishment of existing installations should be reviewed by an accredited expert on energy saving and energy efficiency to determine legal compliance. Without such a review, the project design cannot be approved by the government.

The cement industry could partly replace fossil fuels by co-combusting biomass to heat the kilns. Since biomass, when produced sustainably, is a renewable energy source, also the “Law of the Republic of Kazakhstan to support the use of renewable sources of Energy” becomes relevant. However, this law only defines incentives to promote the use of renewable energy to generate power which is delivered to the grid or heat which is delivered to a district heating company, subject to a feed-in-tariff that is approved by the municipality.²³

The National Communication of Kazakhstan to the UNFCCC estimates the organic waste resources in the country at around 45 million tons per year.²⁴ Within the cement industry there are some waste streams from the food processing industry considered for co-combustion in cement kilns.²⁵ The processing of agricultural residual waste in a productive manner is one of the objectives defined on the Green Economy Concept but there is no legislation which provides incentives for the co-combustion of organic material in cement kilns.²⁶

The use of biomass by ETS participants in Kazakhstan is not recognised as carbon neutral under the law. ETS participants should report on biomass usage and the associated CO₂ emissions using the emission factors of the Intergovernmental Panel on Climate Change (IPCC). This is currently a barrier for cement plants to invest in biomass use as an alternative fuel.

3.5 Waste co-incineration and clinker substitution

The Green Economy Concept includes policy objectives for waste management. By 2030 it aims to have 40% of waste recycled and 95% of the waste either recycled or disposed in a sanitary landfill. The co-combustion of waste in cement kilns can contribute to the sanitary utilisation or processing of waste.²⁷ According to the cement industry representatives, this is feasible only if waste collection and handling is improved, providing a consistent and reliable source of waste within the vicinity of a cement plant.²⁸ The co-combustion of municipal solid waste may require

²² By the end of 2015, several companies still had to complete their first audit.

²³ Law of the Republic of Kazakhstan, Support for renewable energy (with amendments and additions as of 12.29.2014).

Order of the Minister of Energy of the Republic of Kazakhstan dated February 20, 2015 № 118 On approval of the Rules of the tariff to support renewable energy sources.

²⁴ Ministry of Environment Protection, Kazakhstan's Second National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change (Astana, 2009).

²⁵ Interviews with representatives from undisclosed cement companies in Kazakhstan.

²⁶ Concept for transition of the Republic of Kazakhstan to Green Economy, Astana 2013, Approved by the President of the Republic of Kazakhstan approved on May 30, 2013 #557.

²⁷ Under the Kazakhstan ETS the organic fraction of waste is not considered carbon-neutral.

²⁸ Interviews with representatives from undisclosed cement companies in Kazakhstan.

investments in flue gas treatment to ensure that air emissions, including NO_x and SO_x remain within regulatory limits. The emission of these gasses is subject to regulation by the Government of Kazakhstan, which, according to the Green Economy Concept aims to align its air emission standards with European emissions standards by 2030.²⁹

For each increase in the combustion of municipal solid waste replacing 1% of the total energy in the fuel mix, the carbon emissions are reduced by 1.6 kg CO₂/tonne clinker or 1.3 kg/tonne cement. Increasing the share of municipal waste in the fuel mix from the current 0% to 18% would therefore reduce carbon emissions by around 30 kg CO₂/tonne clinker and 23 kg CO₂/tonne cement.

There is significant potential for clinker substitution in Kazakhstan. Important suppliers of slag are the steel mills (blast furnace slag), power plants (fly ash) and fertiliser plants. For example, the Arcelor Mittal steel mill in Temirtau has significant amounts of metallurgic slag stored on their premises while phosphoric slag is available near Shymkent. Not all these sources are suitable. Metallurgic slag should be cooled quickly so that it retains its amorphous structure. Fly ash is often mixed with ground ash from the bottom of power plant boilers, or it is wet. That makes it less suitable as a clinker substitute.

Affordable access to suitable clinker substitutes, at reliable and constant quality and a feasible price, could yield significant greenhouse gas emission reductions. For each increase in the combustion of municipal solid waste replacing 1% of the total energy in the fuel mix, the carbon emissions are reduced by 1.6 kg CO₂/tonne clinker or 1.3 kg/tonne cement. Increasing the share of municipal waste in the fuel mix from the current 0% to 18% would therefore reduce carbon emissions by around 30 kg CO₂/tonne clinker and 23 kg CO₂/tonne cement.

There are three important barriers to clinker substitution. The first is the transport distances and related costs. Clinker substitutes are available at low cost only to the few the cement companies in the country which are located close to the sources of these substitutes. The second barrier is the construction standards in Kazakhstan, which limit development of the full potential for clinker substitution. For example, the government of Kazakhstan does not allow for the substitution of clinker in the cement used for road construction. The third barrier is the confidence of construction companies and end consumers, in blended cements.³⁰

²⁹ Concept for transition of the Republic of Kazakhstan to Green Economy, Astana 2013, Approved by the President of the Republic of Kazakhstan approved on May 30, 2013 #557.

³⁰ Interviews with representatives from undisclosed cement companies in Kazakhstan.

4.

International practices

Lessons can be drawn from international experience with policies, measures and standards on climate, energy, construction and waste which affect the cement industry.

There are several countries which have developed innovative policies and measures to incentivise low-carbon development of their cement industry. Interesting examples are the EU, which operates an ETS like Kazakhstan, but also has regulations in place on the co-combustion of waste. In researching best practices the regulatory framework of Mexico and a few other countries and provinces have also been analysed.

4.1 European Union

The European Union has adopted legislation which aims to incentivise low-carbon development of the cement sector by:

- Regulating the GHG emissions under the European Emission Trading Scheme,
- Regulating the co-combustion of waste in cement kilns,
- Legislation on energy efficiency,
- Clinker substitution in relation to cement standards.

The EU “Roadmap for moving to a competitive low carbon economy in 2050”, aims at a reduction in greenhouse gas emissions by 2050 at 80% below the 1990 level. To achieve that goal, the Roadmap foresees a reduction of CO₂ emissions from industry between 83% and 87%.³¹

The cement industry was responsible for about 5.6% of the total CO₂ emissions in the European Union in 2012. This share used to be higher but in the period 2009-2011 the CO₂ emissions from the European cement industry declined by 25% compared to 1990. Since the production of both cement and clinker showed a similar decline, the emission reductions can be largely attributed to a decline in output. In the period 2005-2011, the CO₂ emissions per tonne cement decreased by 1.2 to 2% over the entire 6-year period.³²

Emission trading is a key element of the European regulatory framework to incentivise low-carbon development of large industrial emitters. Since 2005

³¹ European Commission, A Roadmap for moving to a competitive low carbon economy in 2050, (Brussels 2011).

³² Neuhoff, K., et al. Climate Strategies, Carbon Control and Competitiveness Post 2020: The Cement Report FINAL REPORT February 2014.

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the European Union operates an Emissions Trading Scheme in which cement producers take part which operate:

- rotary kilns with a production capacity exceeding 500 tonnes/day or
- other furnaces with a production capacity exceeding 50 tonnes/ day.

Like in the Kaz ETS, the EU ETS covers both the emissions from the combustion of fuels and the process emissions from cement plants. The incentives provided by an ETS are characterised by the way in which the number of allowances per installation is calculated, and the way in which they are issued. In the first (2005-2007) and second compliance period (2008-2012) the number of allowances allocated to cement plants was based on historic emission levels. For the EU ETS phase III (2013-2020), the EU adopted benchmarks to avoid perverse subsidisation of inefficient plants and to reward early action, e.g. mitigation measures taken before the baseline years.³³

The benchmark which was agreed to by the European Commission was 766 kg CO₂ per tonne of grey cement clinker and 987 kg CO₂ per tonne of white cement clinker. The decision was based on research undertaken by Ecofys, using data and methodologies from the European cement industry association CemBureau and the World Business Council for Sustainable Development's Cement Sustainability Initiative. The research from Ecofys arrived at a preliminary benchmark value of 780 kg CO₂ per tonne of grey cement clinker as a sector wide figure, based on the average of the best 10% installations with the lowest CO₂ emissions per tonne clinker. The benchmark value was preliminary, and the report included recommendations for its finalisation.³⁴

The benchmark calculated by Ecofys was based on the carbon emission per tonne clinker produced (tCO₂/t clinker). Clinker production is the most energy-intensive production step in cement production and the major source of process emissions. It typically makes up over 90% of the emissions from a cement production process. For the EU, another argument for using a clinker benchmark rather than a cement benchmark was that there is a lot of trade of clinker between installations. A grinding station which receives all clinker from a different installation can produce cement while having hardly any emissions. The opposite would be true for an installation that produces clinker but does not produce cement. However, using a clinker benchmark has also encountered opposition from environmental groups, arguing that it would exclude clinker substitution, an important mitigation option, from the mitigation options incentivised by the EU ETS.³⁵

In addition to the benchmark, the EU adopted a cross-sectoral correction factor (CSCF), which would be applied if the bottom-up sum of the allocations for the installations from all sectors differs from the ETS-wide cap set. No correction factors were applied for elements which could explain differences in emissions between cement plants, such as the moisture content of the raw materials, plant age or size, technology, whether grey or white cement is produced, etc.

The measurement, reporting and verification (MRV) of emissions from cement plants which are part of the EU ETS, combines process and

³³ Neuhoff, K., et al. Climate Strategies, Carbon Control and Competitiveness Post 2020: The Cement Report FINAL REPORT February 2014.

³⁴ Ecofys, Methodology for the free allocation of emission allowances in the EU ETS post 2012 - Sector report for the cement industry, (2009).

³⁵ Carbon Watch, EU Emission Trading System: failing at the third attempt, April 2011, [download](#).

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combustion emissions. The combustion emissions are calculated from the amount of fuel combusted. The process emissions are calculated based on the mass balance, generally combining information on the activity level (e.g. the amount of raw materials processed) and multiplying this by an emission factor.³⁶

The incineration of waste in cement kilns is proposed as an option to improve resource efficiency. CemBureau, the representative organisation of the cement industry in Europe, based in Brussels, explains that its members use tyres, solid recovered fuels, used oils, animal meal, sewage sludge, foundry sands, fly ashes and filter cakes as alternative fuels and additives. The calorific value of these materials contributes to the heating of the cement kilns, while the mineral content is used as raw material to produce clinker.³⁷ The EU allows for the combustion of waste under the following conditions:

1. Incineration or co-incineration plants need a permit, issued by a competent authority which checks that the requirements in the Directives are complied with.
2. Certain types of vegetable and animal wastes are exempt from the requirement to obtain a permit.
3. Emission values are not exceeded. The emissions of carbon monoxide, dust, total organic carbon, hydrogen chloride, hydrogen fluoride, sulphur dioxide and the nitrogen oxides should not exceed the values set out in the Directive.³⁸ Within these emission limits, cement kilns can be granted an exception on their emission levels of nitrogen oxides and dust.

In addition, the European Commission has set an energy efficiency target of 20% energy savings by 2020 compared to the Business as Usual energy consumption in 2020. For industry the measures adopted to improve energy efficiency in Europe includes compulsory energy audits for large energy consumers every four years. Financing is available to support research on energy efficiency as well as demonstration and adoption of energy-saving technologies on both small and large scale.³⁹ The EU has no specific EU legislation targeting waste heat recovery by cement plants.

Finally, the EU cement standard, EN197,⁴⁰ specifically encourages the production of blended cements by defining a wide range of allowable substitutes for clinker. The ways in which different cement types, with different clinker contents, are applied varies amongst the different EU member states. In most member states the share of cement types with lower clinker content has remained constant or increased in the period from 2000 to 2010.⁴¹ However, this observation goes without evidence that this is the result of the adoption of EN197. In addition, the EU standardisation body is developing new standards relating to construction materials (EN15804), setting rules for declarations regarding the life cycle of construction products.⁴²

³⁶ European Commission, Guidance Document, The Monitoring and Reporting Regulation – General guidance for installations, MRR Guidance document No. 1, Version of 16 July 2012, [download](#).

³⁷ For further information: <http://www.cembureau.be/topics/resource-efficiency-cement-industry/co-processing-cement-industry-using-waste-resource>, site visited at 2 July 2015.

³⁸ Directive 2000/76/EC of the European Parliament and of the Council of 4 December 2000 on the incineration of waste, ([link](#)) ([consolidated version](#)).

³⁹ For further information on the energy efficiency programme in the EU: <https://ec.europa.eu/energy/en/topics/energy-efficiency> and on the financing: <https://ec.europa.eu/energy/en/topics/energy-efficiency/financing-energy-efficiency>

⁴⁰ European standards EN 197-1 Cement Composition (2000).

⁴¹ CEMBUREAU, Cements for a low-carbon Europe, (Brussels, 2012).

⁴² Interview with Manuela Ojan, WBCSD-CSI, on 25 November 2015.

4.2 Mexico

Mexico was amongst the first countries to submit an INDC in which it committed to reduce its emissions in 2030 by 25% compared to a Business as Usual baseline, which are the future Mexican emission levels in a scenario without the implementation of climate policies. This target is unconditional, which means that this commitment is not conditional upon international support. The target is in line with the national commitment stated in the Mexican General Law on Climate Change, which aims to reduce emissions by 2050 at a level 50% below the 2000 level.⁴³

The Mexican government has adopted a series of laws to incentivise low-carbon development. The policies which are relevant for the cement industry are:

1. A 5 USD/tCO₂e carbon tax on fossil fuels, which can also be paid with CDM credits from projects in Mexico. The tax excludes natural gas and is levied on the first producers or importers.⁴⁴
2. A National Emissions Registry which requires industry to report its emissions.⁴⁵
3. The option of implementing an emissions trading scheme.⁴⁶

In addition, the Mexican government is seeking international support for a Nationally Appropriate Mitigation Action (NAMA)⁴⁷ in the cement sector. The NAMA stems from a cooperation between the State Secretariat of Environment and Natural Resources (SEMARNAT) and Mexico's National Chamber of Cement (CANACEM). It aims to reduce GHG emissions below the business-as-usual scenario by 9% in 2020, and 15% in 2030, by promoting both standards for the clinker/cement ratio and to increase the use of blended cement in domestic housing projects, and the use of alternative fuels in the cement industry.⁴⁸

4.3 Alberta SGER

The Canadian province of Alberta adopted the Specified Gas Emitters Regulation (SGER) in 2007, which introduced the first carbon compliance pricing system in North America. The natural resources industries, notably oil and gas in Alberta, are responsible for a high share of emissions, as in Kazakhstan. 50% of Alberta's greenhouse gas emissions are covered by a cap, which for 2015 was set at a greenhouse gas emission level per unit production of 12% below the average emission level of 2003-2005. The approach in Alberta deviates from ETS systems in the EU and Kazakhstan since:

1. Installations with emissions exceeding 50,000 tCO₂e/year need to report their emissions and only those whose emissions exceed 100,000 tCO₂e/year also need to comply with an emission intensity target. This threshold is relatively high.
2. The facility-level targets are defined as emissions intensity goals, total emissions divided by production levels, as opposed to an

⁴³ Mexico, Nationally Determined Contribution (INDC).

⁴⁴ World Bank, Putting a price on carbon with a tax.

⁴⁵ Muñozcano, L.A., Presentation Update in Mexican Policy Developments, PMR.

⁴⁶ IETA, Mexico - The World's Carbon Markets: A Case Study Guide to Emissions Trading (2014).

⁴⁷ NAMAs are part of the UNFCCC mitigation framework and refers to "any action that reduces emissions in developing countries and is prepared under the umbrella of a national governmental initiative". They can be supported and enabled by technology, financing, and capacity-building and are aimed at achieving a reduction in emissions relative to 'business as usual' emissions in 2020.

⁴⁸ Further information available at: Mitigation Partnership, Energy Efficiency and Alternative Energy Use in the Cement Sector, [download](#); CCAP, Developing a Sustainable Mitigation Program for Mexico - Implementing Sector-Wide NAMAs to Reduce Greenhouse Gas Emissions, [download](#).

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absolute cap on aggregate emissions. This allows companies to increase absolute emissions if they follow an increase in production.

3. Allowances are distributed ex-post. Compliance can be achieved by reducing emissions, paying a fee of 15 CAD/tCO₂e (11 EUR/ tCO₂e) per year into a dedicated fund, purchasing offsets from projects in Alberta, or by purchasing Emissions Performance Credits (EPCs) from participating facilities which reduced their emissions intensity below their target and want to sell any extra reductions. The 15 CAD/tCO₂e acts as a price ceiling on compliance instruments.⁴⁹

4.4 California AB 32

The Californian ETS was introduced with the Global Warming Solutions Act, also known as Assembly Bill 32 or AB 32. It saw its first trading period in 2013 and has a participation threshold of 25,000 tCO₂e/year. The programme covers about 85% of the state's emissions in 2015. This high coverage is due to participation of the transport sector and a carbon levy on retail sales of natural gas to incentivise also smaller consumers to reduce emissions. Some of the more distinct characteristics include:

1. Compliance is assessed in triannual periods.
2. The penalty for non-compliance is defined as the requirement to purchase four allowances for each excess tonne CO₂e emitted.
3. The reduction is progressive. Each new compliance period the percentage reduction is higher than in the previous period.
4. 4% of the allowance budget is deposited in an Allowances Price Containment Reserve (APCR).
5. As in the EU, the amount of free allowances allocated depends on an industry's economic leakage risk. Cement is considered to have a high leakage risk.
6. The allocation is based on a combination of product and energy-based benchmarks.
7. The price of auctioned allowances has a floor of 12.10 USD/tCO₂e in 2015 and offsets can be used only up to 8% of a company's total compliance obligation.⁵⁰

4.5 WBCSD

The WBCSD does not constitute an international policy example but it has formulated specific policy recommendations to incentivise low-carbon cement production under its Cement Sustainability Initiative (CSI). The recommendations from the WBCSD, which are relevant for Kazakhstan, are:

1. Eliminate energy price subsidies which can act as a barrier to the adoption of energy efficiency measures.
2. Develop legislation on waste management which encourages co-combustion in cement kilns of waste for which landfilling is the only remaining disposal option.
3. Train policy-makers and increase public awareness on industrial symbiosis and recycling. Define the role which alternative fuel use in the cement industry can have to improve waste management. Consider the mining of existing landfills.
4. Encourage clinker substitution but make the options subject to independent environmental impact studies.

⁴⁹ IETA, Alberta: an emissions trading case study, The World's Carbon Markets: A Case Study Guide to Emissions Trading (Last Updated: May 2015), [download](#).

⁵⁰ IETA, California: an emissions trading case study, The World's Carbon Markets: A Case Study Guide to Emissions Trading (Last Updated: May 2015), [download](#).

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5. Revise existing cement standards and codes to allow for increased use of blended cement, and raise consumer awareness and confidence in blended cements.
6. Develop policies for predictable, objective and stable CO₂ constraints.
7. Provide fiscal incentives for waste heat recovery.⁵¹

⁵¹ WBCSD/IEA, Cement Technology Roadmap 2009 – Carbon emission reductions up to 2050, (2009) [download](#).
WBCSD/IEA, Technology Roadmap – Low-Carbon Technology for the Indian Cement Industry (2013), [download](#).

5.

Comparing regulatory frameworks

The policy recommendations are derived from a gap analysis, in which laws and regulations in Kazakhstan are compared with the international best practices.

5.1 Gap analysis on the Kaz ETS

This part of the gap analysis compares the design features of the Kaz ETS with international practices. The EU ETS was the first installation-level trading scheme for greenhouse gas emissions and includes numerous cement plants for the compliance period 2013-2020. This makes the EU ETS an interesting example for a comparison with Kaz ETS. Table 3 compares the design features of the Kaz ETS with the EU ETS in different compliance periods. It builds on the earlier work done by the EBRD under the Partnership for Emissions Trading in the EBRD Region (PETER).⁵²

5.2 Recommendations on the Kaz ETS

The comparison of the international practices with the current policy package in place in Kazakhstan, and the policy principles presented in the second chapter, have been used as basis for the policy recommendations.

ETS Ambition: The number of free allowances under the Kaz ETS in 2015 was 1.5% below the emission level of 2010. The Green Economy Concept on the other hand, stipulated the goal to reduce energy consumption per unit of GDP with 10% by 2015 compared to 2008. Considering that already in the period 2008-2014, GDP increased by 40%,⁵³ a 10% reduction in carbon intensity would have allowed the country's absolute emissions to grow by 26%. That makes the Green Economy Concept less ambitious than what the ETS foresees.

In its INDC Kazakhstan committed to reducing its GHG emissions with 15% by 2030 compared to the level in 1990. The GHG emission level of 1990, the country's base year, was around 371 Mtonne CO₂e. In 2013 this level stood at around 303 Mtonne CO₂e, an 18% reduction.⁵⁴ The 15% emission target for 2030 would allow Kazakhstan's emission to grow slightly in absolute terms. Since the government requires a reduction in absolute emissions from its ETS participants, the ETS is expected to make a relatively large contribution to the emission target in the INDC.

⁵² For further information: www.ebrdpeter.info

⁵³ GDP figures obtained from: <http://data.worldbank.org/>, site visited on 6 January 2016.

⁵⁴ Kazakhstan, National Inventory Report 2015,

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Table 3: Comparison of ETS design features for the cement sector Kazakhstan and the EU.⁵⁵

Item	Kaz ETS		EU ETS	
	2014-2015	2016-2020 (expected)	2008-2012	2013-2020
Participation criteria for cement plants	Annual emissions of the legal entity which participates in the ETS exceeding 20,000 tCO ₂ e.		Production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day	
ETS-wide cap type and trajectory	Absolute cap at 100% of 2010 emission level, annual reduction of 0% in 2014 and 1.5% in 2015.	Absolute cap at average emission level of 2013-14	Absolute cap.	Absolute cap which declines with 1.74% per year to a level 21% below the 2005 emissions by 2020.
Cap type for cement plants	Grandfathering, based on 100% of the emission level in 2010	In the latest NAP, grandfathering for the period 2016 to 2017, based on 100% of the average emission level of 2013 to 2014. Beyond 2017 benchmarking might be applied.	Grandfathering	Product benchmark based on clinker.
Total allocation	155 million in 2014 153 million in 2015	746.5 million for the years 2016-2020, according to the latest available NAP, excluding a NER of 21.9 million..		2.04 billion in 2013, declining to 1,78 billion in 2020
Scope	Direct CO ₂ emissions from stationary combustion and including process emissions.	Direct CO ₂ emissions from stationary combustion.	Direct CO ₂ emissions and PFC and N ₂ O in some sectors, from stationary combustion and including process emissions.	
MRV and compliance cycle	The compliance period is the calendar year. Monitoring reports, which have been verified by an accredited independent third party, need to be submitted by 1 April after the monitoring year.		The compliance period is the calendar year. Compliance deadline is the following 30 April.	The compliance period is the calendar year. The deadline for reporting is the following 31 March and for compliance 30 April.
New Entrants Reserve	12% of the cap for 2014 and 13% of the cap for 2015.	Facilities that start operation during a compliance period need to purchase allowances from the NER. The NER size is 4.4 million per year, based on an estimate of future GDP growth.	5% of average cap	3.1% of average cap
Share auctioned	No auctioning	The government considers to auction 10-15% of allowances but this requires changing the Ecological Code.	3% of average cap. The auction revenues were used to support mitigation measures or went to the state budget of the	57% of average cap under ETS. For the cement sector an average of 88% of historic production, multiplied with

⁵⁵ Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.

Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community ("Revised ETS Directive")

Republic of Kazakhstan code - Ecological code of the Republic of Kazakhstan (with amendments as of April 27, 2012) and the related Ministerial Orders and Decrees.

Neuhoff, K., et al. Climate Strategies, Carbon Control and Competitiveness Post 2020: The Cement Report FINAL REPORT February 2014.

Thomson Reuters Point Carbon, Existing Emissions Trading Schemes – A Comparative Analysis, (Oslo, 2013)

Interview with Alexei Sankovski (Chief of Party, Tetra Tech, Consultant for USAID, Kazakhstan Climate Change Mitigation Programme (KCCMP) and Alexey Cherednichenko (Carbon Market Expert), on 9 July 2015.

Price information obtained from: www.comex.kz, 13 July 2015, and from Interview with Kanat Shynybay from Caspy Exchange, on 10 July 2015.

IETA, Kazakhstan The World's Carbon Markets: A Case Study Guide to Emissions Trading (Last Updated: May 2015), [download](#).

EU Commission, The EU Emissions Trading System (EU ETS) Factsheet (Brussels, 2013).

Bart, I., Presentation: Compatibility and Comparability of the ETS in Kazakhstan (Astana, 2015)

CDC Climat, Climate Focus, Background Paper, Article 24a EU ETS, (Amsterdam, 2010), [download](#).

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Item	Kaz ETS		EU ETS	
	2014-2015	2016-2020 (expected)	2008-2012	2013-2020
			Member State.	the benchmark, is allocated for free. Auction revenues are used to support carbon capture and storage, and innovative renewable energy technologies.
Correction factors	No correction factors were applied, other than the linear reduction factor.	Only linear correction factors which reduce the allocation for all sectors. The use of leakage correction factors is under discussion.	The EU applies the following correction factors: 1. Leakage correction factor 2. Cross-sectoral correction factor ETS-wide adjustment factors	
Domestic offsetting provisions	Domestic offsetting allowed. Offset projects in Kazakhstan need to apply methodologies provided or developed by an authorized environmental protection agency. To date, one domestic offset project has been developed, the Zhambyl hydro power plant, and its first credits have been issued.		Emission Reduction Units from Joint Implementation (JI) projects within non-ETS installations in the EU can be used for compliance in the EU ETS. For JI projects, which risked double counting with the EU ETS, like grid-connected renewable energy projects, a JI reserve was introduced within the National Allocation Plans.	The use of domestic offsets for compliance within the EU ETS is currently not supported. The revised ETS Directive includes provisions for domestic offsetting, Article 24a. For the article to become operational, the EU Commission needs to adopt implementing legislation, which to date has not happened.
Eligibility of international offsets	There are legal provisions for the use of Certified Emission Reductions (CERs) from the CDM and Emission Reduction Units (ERUs) from JI projects outside Kazakhstan for compliance purposes within the Kaz ETS. The use of this option depends on the outcome of the international climate negotiations.		CERs and ERUs up to 50% of reduction effort for 2008-2020, with restrictions on credits from large hydro, HFC ₂₃ and N ₂ O abatement and forestry activities.	Additional restrictions apply compared to Phase II, including that only CERs and ERUs are eligible from projects registered before 2012, or registered after 2012 if located in a Least Developed Country.
Banking	Not to the next compliance period, nor between years.	Banking between periods is considered.	Full banking allowed	Full banking allowed
Prior approval of investments or compliance plan	The submission of an investment plan is optional, not required.		Not required	
Trade activity	There has been trading activity in Phases I and II. ⁵⁶ During Phase II: 35 deals worth KTZ 182 million (EUR 1 million), 1.3 million allowances traded.	Not yet available.	In 2012, 7.9 billion allowances were traded with a total value of EUR 56 billion.	Not yet available.
Penalty level	40 EUR/tCO ₂ e	5 times the market price over the last month, which for June 2015 was around EUR 4.	40 EUR/tCO ₂ e	100 EUR/tCO ₂ e
Price level	Prices have been rather volatile, moving from KTZ 20 to 1,100 (EUR 0.1 to 7.1). The average price in 2015 is around 3.5 EUR.	Not yet available.	EUA prices reached EUR 25-30, but decreased to around EUR 7 by the end of the period.	EUR 5.88 (2014 average) EUR 6.91 (Q1 2015)

The INDC requires that the absolute greenhouse gas emissions from Kazakhstan show only a slight increase. This means that the country must reduce the GHG intensity of its economy per unit GDP, with roughly the same percentage as its GDP grows or changes. In a growing economy, the ETS sector is expected to show a faster decoupling of its emissions from GDP growth, compared to the sectors which are not covered by the ETS. In the period 28 March 2014 to 29 June 2015, allowances in Kazakhstan were traded at a maximum price of 1,500 KTZ/allowance⁵⁷ (7.2 EUR/allowance), while the average trading price over the first months of

⁵⁶ Different sources agree on the trade volume, which was estimated at 1.3 million allowances. The trade value was estimated at KTZ 182 million in 35 transactions by one and KTZ 618 million by another.

⁵⁷ Information obtained from: www.comex.kz, 13 July 2015.

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2015 has been around 3.5 EUR/allowance.⁵⁸ Experience from the EU ETS indicates that this price level is too low to affect investment decision and drive mitigation action in the cement sector.⁵⁹ Representatives from cement companies confirmed that the financial impact of the ETS was too small to affect their investment decisions, in which case the ETS can bring little environmental gains.⁶⁰ It is important that trading periods and targets are set over a longer period, so that predictability of the carbon price signal increases.

Allocation principles: The gap analysis showed that the allocation of free allowances in the second compliance periods of both the Kaz ETS and the EU ETS was based on grandfathering. For the third compliance period the EU applies benchmarking to determine its allocation. The Government of Kazakhstan considers including benchmarking as a possible basis for the allocation for the compliance period from 2018 to 2020.⁶¹

Moving to a benchmark based on the **emission level per tonne product of the most efficient plants** is recommended as grandfathering puts historically inefficient cement plants at an advantage, which contradicts the objective to reward and incentivise carbon efficient cement production. Carbon benchmarks based on sector averages could also deter investments in carbon efficiency.

Benchmarking approach: For Phase III two different NAPs are under development. One based on grandfathering, developed by Zhasyl Damu, and one based on benchmarking, developed by USAID. According to Zhasyl Damu, benchmarking will probably be introduced halfway the 3rd compliance period, in 2018, following a revision of the Ecological Code.

In the EU the benchmark is based on the emissions of the 10% of installations with the least CO₂ emissions per tonne clinker produced. This also encourages clinker substitution as only emissions from clinker production require allowances. In Kazakhstan clinker substitution is an interesting mitigation option, since the country has a large steel industry and several coal fired power plants which can supply metallurgic slag or fly ash.

As in the EU, the Government of Kazakhstan can adopt a cement benchmark which would encourage blending or adopt a clinker benchmark while encouraging clinker substitution with building codes. In addition to the benchmark, the EU adopted a cross-sectoral correction factor, which would be applied if the bottom-up sum of the allocations for the cement sector differs from the foreseen sector-wide allocation. This avoids that the overall allocation under the EU ETS exceed pre-defined values, for example as production changes faster than expected or plants are shut down.

⁵⁸ Interview with Botagoz Akhmetova, Director ETS Department JSC Zhasyl Damu, Sergey Tsoy (Deputy Director General, JSC Zhasyl Damu I), Askar Kaliyev (Director General, JSC Zhasyl Damu), Nurlan Niyetbayev (Deputy Director General, JSC Zhasyl Damu), on 9 July 2015.

⁵⁹ The price level in the EU is higher, still sources state that also this level is not high enough: Neuhoff, K., et al. Climate Strategies, Carbon Control and Competitiveness Post 2020: The Cement Report FINAL REPORT February 2014.

⁶⁰ Interviews with representatives from undisclosed cement companies in Kazakhstan.

⁶¹ Interview with Ms. Gulmira Sergazina (Director), Saule Zhurnyova (Deputy director), Aida Makazhanova (Head of low carbon development department), Ministry of Energy, Ministry of Energy, Climate Change Department, on 10 July 2015.

Interview with Botagoz Akhmetova, Director ETS Department JSC Zhasyl Damu, Sergey Tsoy (Deputy Director General, JSC Zhasyl Damu I), Askar Kaliyev (Director General, JSC Zhasyl Damu), Nurlan Niyetbayev (Deputy Director General, JSC Zhasyl Damu), on 9 July 2015.

Interview with Alexey Sankovsky (Chief of Party, Tetra Tech, Consultant for USAID, Kazakhstan Climate Change Mitigation Programme (KCCMP) and Alexey Cherednichenko (Carbon Market Expert), on 9 July 2015.

Comparing regulatory frameworks

Two different benchmarks have been developed for the cement sector in Kazakhstan, one supported by USAID and one by the World Bank (Annex 1). However, an allocation based on multiplying a sectoral benchmark with pre-determined production or capacity levels, does not take account of reduced production levels within a compliance period. In the EU, this allowed ETS participants to accumulate a surplus of allowances during the years in which the European economic activity stagnated. In Alberta, the SGER solved this issue by applying a more flexible cap, which is based on efficiency-based targets. However, the downside of this approach is that it provides less certainty to the national government that overall ETS emissions will remain below a certain target level.

A balance between the two would be to allocate a total number of allowances to the cement sector based on the most recently available historic emissions, while using benchmarking to distribute allowances between cement companies. This allows the cement sector to grow, if other sectors or national targets allow, while still incentivising a strong reduction of emissions per unit of product. Since the future production levels and carbon intensity of other ETS sectors in Kazakhstan are uncertain, this would make the ETS more flexible. It may also allow the cement sector more allowances if emissions in other ETS sectors decline.

In both the EU and China wet production lines have been phased out.⁶² In Kazakhstan wet production lines can be granted a grace period during which two benchmarks are used, one for dry and one for wet lines. In a period of five or eight years, the benchmark for the wet lines can decline to reach the benchmark level of the dry lines. This approach was considered both fair and realistic by stakeholders although some argued for a longer grace period.

Issuance: Allowances in the Kaz ETS are issued for free, while in the EU ETS an increasing share is auctioned. Moving to partial auctioning is expected to be included in the reform of the Kaz ETS in for the compliance period starting in 2018.⁶³ The share of the allowances that will be auctioned remains to be defined.

Moving to full auctioning could also be considered. The advantage of full auctioning is that it avoids methodological complexity and treats all cement companies equal. It thereby avoids market distortion between cement companies. However, since it exposes cement companies to a market price which is difficult to predict, it is unclear what full auctioning would mean for the competitive position of the Kazakhstan cement sector in relation to its international competition. The cement sector can argue for a cap on the auction price, referring to the example of the SGER in Alberta, to make the allowance price more predictable. An alternative approach to address leakage would be to include importers into the Kaz ETS which import clinker or cement from countries without equally stringent carbon regulations.

⁶² Interview with Manuela Ojan, WBCSD-CSI, on 25 November 2015.

⁶³ Interview with Ms. Gulmira Sergazina (Director), Saule Zhurnyova (Deputy director), Aida Makazhanova (Head of low carbon development department), Ministry of Energy, Ministry of Energy, Climate Change Department, on 10 July 2015.

Interview with Botagoz Akhmetova, Director ETS Department JSC Zhasyl Damu, Sergey Tsoy (Deputy Director General, JSC Zhasyl Damu I), Askar Kaliyev (Director General, JSC Zhasyl Damu), Nurlan Niyetbayev (Deputy Director General, JSC Zhasyl Damu), on 9 July 2015.

Interview with Alexey Sankovsky (Chief of Party, Tetra Tech, Consultant for USAID, Kazakhstan Climate Change Mitigation Programme (KCCMP) and Alexey Cherednichenko (Carbon Market Expert), on 9 July 2015.

Comparing regulatory frameworks

Reserves: The government of Kazakhstan maintains a New Entrants Reserve of allowances for several purposes. The first is for companies which expand capacity or open a new plant. The Reserve is also the source of carbon offsets, which are issued for verified emission reductions from offset projects in Kazakhstan. When offset allowances come from the New Entrants Reserve this creates uncertainty for offset project developers, whether offset allowances would be available at the time they have verified their emission reductions. Alternatively, the offset allowances may come from the Non-ETS sectors, or could be capped overall, e.g. up to 8% of total allocations.

In the EU ETS, National Allocation plans for 2008-2012 could include a reserve to avoid double counting with domestic offset projects which would free up allowances within the EU ETS. An example is grid-connected renewable energy projects, which could receive domestic offsets, but would also free up allowances allocated to power plants that are connected to the grid and are part of the EU ETS but see the demand for their electricity decline. If the Government of Kazakhstan considers encouraging these types of projects through the domestic offset scheme, the adoption of a domestic offset reserve can avoid double counting with the ETS.

Transparency: Some information, including information on domestic offset projects, the National Allocation Plan and allocation principles or even data used for ETS participants, trade volumes and prices, is not yet available online. This reduces transparency. A dedicated government portal could fill this gap and increase transparency. This could enhance the predictability of the ETS, provide for equal treatment of cement companies, and enhance the confidence of ETS market participants.

Tradability: EU allowances are freely tradable and the EU ETS remains the single carbon market with the highest trade volumes. This creates price transparency and has allowed financial institutions to develop new products based on the underlying value of allowances on the account of ETS participants. An example of such a product are loans which are backed by allowances. Companies with installations under the EU ETS receive allowances at the beginning of a compliance period, but need them for compliance only after the compliance period has ended. In the meantime, the value of the allowances can be used as collateral.

In the EU, annually an amount of allowances exceeding 3 times the annual allocation volume changes ownership. In Kazakhstan, this value is only 0.02%. Some of the reforms that can help increase trade volumes include:

1. Moving to an allocation based on a benchmark for free allocation in combination with auctioning rather than grandfathering.
2. Make the electronic transfer of allowances easier, avoid paper and manual checking,
3. Improve the understanding of the system amongst ETS participants,
4. Increase the volumes of allowances issued through auctions.⁶⁴

The introduction of similar products in Kazakhstan could also benefit the cement industry of that country, but require a stable and predictable market, where also non-ETS participants can own allowances. The recent reforms, including the electronic issuance of allowances, will encourage market liquidity but further reforms might be required to reach a level of trading that supports accurate price discovery.

⁶⁴ Recommendations from the participants to the Stakeholder Workshop in Astana on 24 November 2015.

Comparing regulatory frameworks

Institutional capacity: The institutional capacity should be further improved. Several institutions which support the Kaz ETS stated that they are facing capacity constraints and related difficulties with meeting regulatory deadlines. This increases uncertainty for companies who need to have timely information on their current and future compliance position.⁶⁵

Linking: The EC has gradually expanded the scope of its ETS. This increases the economic efficiency as it increases price stability and long-term predictability.⁶⁶ Kazakhstan could also continue to reach out to other ETS markets and explore options for linking.

A unilateral link could be established if the government of Kazakhstan recognises the allowances or offsets from a different scheme for compliance in the Kaz ETS. To facilitate such linking, for example with the EU ETS, California, Korea or China, further aligning the regulatory framework of the Kaz ETS with trading schemes in other countries is recommended.

The link becomes bilateral if the regulator of the other ETS also recognises the offsets and allowances from Kazakhstan for compliance. If the link is established and the regulatory framework is harmonised, prices between the two systems will converge.

Monitoring and calculation approaches: With the adoption of e-reporting the government of Kazakhstan has significantly improved the MRV process. The Ministry is considering mandatory verification of emissions under the ETS is based on ISO 14065, to commence on 1 January 2018.

The Cement Sustainability Initiative has developed a protocol for the calculation of emission from cement production. This protocol has become a global reporting standard for cement companies and its usage in Kazakhstan would align methodologies under the ETS with international practices. The government could encourage cement companies to use this standard, and participate in the free-of-charge initiative “getting the numbers right” initiative from the WBCSD. This would also align the methodological principles of the Kaz ETS with that of the EU. With only a few differences, for example the cross-sectoral correction factor, the EU follows the approach of the Cement Sustainability Initiative.

5.3 Gap analysis on the non-ETS policies

In the European Union the investment which is needed to achieve certain energy efficiency ambitions are quantified at EUR 100 billion per year and financing is made available to complement and leverage private sector investment. Also for the accelerated adoption of renewable energy, dedicated financing is made available, financed by ETS auction revenues.

In Kazakhstan financing is available only at relatively high interest rates and with short tenures. This poses a barrier to investments in energy efficiency in the cement industry in Kazakhstan.⁶⁷ This is an area where IFIs can step in, potentially sourcing funding from international climate finance.

Other differences between Kazakhstan and the EU, which affect the incentive structure for low-carbon cement development are:

⁶⁵ Interviews with representatives from undisclosed cement companies in Kazakhstan.

⁶⁶ EBRD, Carbon Pricing, Emissions Trading and Linking Emissions Trading Schemes, (Oslo, 2012)

⁶⁷ Interviews with representatives from undisclosed cement companies in Kazakhstan.

Comparing regulatory frameworks

1. Kazakhstan has relatively stringent construction standards which limit the potential for clinker substitution. EU standards can be used as a basis for regulatory reform which allows for increasing clinker substitution while safeguarding construction quality. Lessons can also be drawn from the Mexican effort to adjust building standards to encourage the application of blended cements.
2. The Green Economy Concept includes ambitions for waste processing, and for a reduction in SO_x and NO_x emissions. In the EU cement companies can co-combust waste as long as they meet emission standards. Such an approach may in Kazakhstan both reduce cement emissions while improving waste management.

5.4 Recommendations on the non-ETS policies

Clinker substitution: The extent to which clinker is substituted is limited due to the construction standards, transport distances and consumer confidence. The construction standards can be revised following examples from the European Union. Public awareness campaigns can raise the confidence of consumers and construction companies in blended cement.

Co-combustion of waste: Reduce, re-use and recycling should be the first priorities before a product is disposed of in a landfill. For products for which landfilling is the only remaining disposal option, co-combustion in a cement plant should be encouraged if air emission limits are not exceeded.

In the long term, Kazakhstan could adopt the approach from the EU, where co-combustion is subject to air emission limitations, or the approach from Turkey, where only a selection of materials can be co-combusted.⁶⁸ This is to avoid that the co-combustion of waste leads to an increase in hazardous air emissions. To ensure that policies are environmentally integrated, a reduction of CO₂ emissions should not lead to an increase of other air emissions.

Secondly, improving waste management should increase the availability of waste. Examples are municipal solid waste, industrial waste, oil sludge, sewage sludge and organic waste from food processing industries like cotton stalk and rice husk. The limitations to the use of sludge lies in its quality, whereas the organic waste streams are often too expensive. Proper management of these waste streams, including potential separation for waste streams at the source, and reduced transport costs, can enhance the availability of waste for co-combustion.

Transport: Transport costs are prohibitive to some measures which require that bulk resources are transported over large distances. This primarily affects the ability of cement companies to substitute clinker and in some cases, also their access to affordable alternative fuels. Coordinating logistics at the national level can reduce transport costs. For example, cement is transported from the factories to urban areas where the power plants are located. Reverse logistics of fly ash from these power plants can reduce transport costs.

⁶⁸ About 30 of the 50 cement plants in Turkey have a licence for co-combusting hazardous waste, in addition to three dedicated incineration facilities. The cement plants are only entitled to incinerate wastes, such as tyres, waste oils, paint sludge, solvents or plastic wastes, considering that cement plants do not have adequate stack gas treatment.

Comparing regulatory frameworks

Access to financing: Auctioning revenues from an ETS can be used to fund investments in energy efficiency measures in industry, like waste heat recovery. This is in line with the approach in the EU, where auctioning revenues are used for mitigation actions, notably renewable energy and carbon capture and storage. It is also in line with the policy principle to remove barriers to investment in low-carbon development.

6.

Policy Roadmap

The Policy Roadmap summarises the policy recommendations which have been derived from the analysis of existing policies in Kazakhstan, compared with international best practise in the gap analysis.

6.1 Policy interventions

Table 4 provides an overview of the relevant practices identified from the gap analysis.

Table 4: Countries from which best practice examples have been identified.

Policy instrument or objective	EU	Mexico	Alberta	California
ETS				
Carbon tax/energy pricing				
Incentivise clinker substitution				
Incentivise the co-combustion of waste or biomass				
Incentivize Waste Heat Recovery				
Incentivize energy efficiency				

The recommendations which were derived from the gap analysis cover both ETS and non-ETS policies and measures. The first eight recommendations provide suggestions for ETS reform. The remainder encourage clinker substitution, the use of waste alternatives and energy efficiency measures.

The policy principles defined in section 1.2 have been used as a basis for the policy recommendations. The principles define what the policies should aim to achieve, and which negative side effects should be avoided. Table 5 provides an overview of both the recommendations and the policy principles which they target.

Policy Roadmap

Table 5: Policy recommendations.

#	Policy instrument or objective	Recommendations	Policy principles targeted
1	ETS: Align ambition	<p>The government is aligning the ambition of the ETS with the INDC. The ambition level of the Kaz ETS could also be harmonised with the national policies on energy efficiency and renewable energy to further improve regulatory certainty for the private sector.</p> <p>If the ambition level of the Kaz ETS drives the price of allowances upwards, the allowance price can be cushioned by, for example:</p> <ol style="list-style-type: none"> 1. Allowing ETS participants to buy allowances from the government at a fixed price. Like in Alberta, this price should be above the market price and would act as a price ceiling. 2. Introducing a Market Stability Reserve⁶⁹ like in the EU ETS, or the Allowances Price Containment Reserve in California, which releases allowances if the number in circulation drops below a certain value. 	The policies should be predictable and stable (1), target ambitious and realistic emission reductions (3), while avoiding market distortions (4).
2	ETS: Move to benchmarking	<p>Move to carbon efficiency benchmarking based on the best performing installations as the basis for the allocation of allowances between ETS participants within each sector, defining the benchmark on the carbon emission lever per tonne clinker of the most efficient cement plants. For the next trading period, starting in 2018, scenarios and investment analysis can provide a basis for an allocation based on comparable effort, also to divide allowances amongst the different sectors of the economy.</p> <p>Move to benchmarking based on the CO₂ emissions per tonne clinker or cement produced, quantified according to the protocol developed by the Cement Sustainability Initiative. If the cement producers in Kazakhstan produce clinker which is typically mixed with gravel and sand by other companies, a clinker baseline avoids complexity. A clinker benchmark can include the use of clinker substitutes to ensure that the ETS also incentivises that mitigation option.</p> <p>Separate benchmarks can be developed for wet and dry production, recognising the large difference in emissions between these two production methods. However, to incentivise the decommissioning of wet production capacity, the wet benchmark can gradually decline to the benchmark level of the dry production lines. This allows Kazakhstan to move to one cement benchmark in five or eight years.</p> <p>The benchmark can be based on the carbon intensity of the cement sector for the three most recent years for which data is available. The benchmark can also be based on sectoral low-carbon development scenarios, describing what is technically and economically realistic. For each plant the allocation is based on multiplying the benchmark with the production volumes for the same three years. Correction factors can be applied per year to create a downwards sloping cap.</p>	The policies should provide incentives based on objective emissions and real or recent production levels (2), target ambitious and realistic emission reductions (3), while avoiding market distortions (4).
3	ETS: Adopt market regulations	<p>When opting for benchmarking, rather than full auctioning, the allocation of free allowances is arrived at by multiplying the benchmark with a production level. In case an installation exceeds the benchmark, then it would require to buy the shortfall of allowances through the government auction or in the carbon market. The production levels could then still be based on historic production levels. Ex-post correction of the NAP based on actual production volumes is not needed. The market can facilitate re-distribution. To support the market, the government can stimulate the creation of a liquid and stable market by:</p> <ol style="list-style-type: none"> 1. Removing provisions which allow the government to claim allowances back from ETS participants if international agreements create a need to do so. The number of allowances which can be revoked will not exceed the number of allowances issued in one year. However, this does restrict the ability of ETS participants to sell allowances on a spot or forward basis, limiting the development of a market for allowances. 2. Extending the ability to open a registry account and trade allowances beyond ETS participants alone, allowing also financial institutions to trade allowances and/or use them as collateral. 3. Allowing for banking within compliance periods. Banking between compliance periods should be avoided during early phases to avoid the accumulation of surpluses. 4. Ease trading, not only by making the electronic transfer of allowances easier but also by improving the understanding of the trade system amongst ETS participants. 	The policies should be predictable and stable (1), provide incentives based on objective emissions and real or recent production levels (2).
4	ETS: Adopt partial or full auctioning	<p>Move to partial auctioning, where only a part of the allowances issued to each ETS participants are issued for free. Use the auction revenues to stimulate investments in abatement measures. Full auctioning can also be considered, while bearing in mind that partial free auctioning reduces the costs for industry to comply with the ETS. This also reduces the costs compared to international competitors which do not face carbon constraints.⁷⁰</p>	The policies should avoid market distortions (4) and remove barriers to investment in low-carbon development (5).
5	ETS: Streamline access to the	<p>Allowances from domestic offset projects should come from a set-aside in addition to the NER. The regulator is to ensure that domestic project approvals and related issuance will not exceed the set-aside established from within the ETS cap and the non ETS cap.</p>	The policies should be predictable and

⁶⁹ ICAP, EU Emissions Trading System (EU ETS), (2015)

⁷⁰ For further information on the EU's position on auctioning versus free issuance, see: http://ec.europa.eu/clima/policies/ets/cap/allocation/index_en.htm

Policy Roadmap

#	Policy instrument or objective	Recommendations	Policy principles targeted
	NER		stable (1).
6	ETS: Streamline the use of domestic offsets	<ol style="list-style-type: none"> 1. Develop and publish procedures for the development and approval of domestic offset projects and the issuance of allowances for verified emission reductions. 2. Develop and implement a governmental information platform which provides information on, for example, the ETS participants, their compliance position and on domestic offset projects. 	The policies should be predictable and stable (1).
7	ETS: Review regulatory framework and procedures, build capacity	<ol style="list-style-type: none"> 1. Include in the reform of the Ecological Code and its by-laws a legal review for consistencies and gaps. 2. Enhance the transparency about procedures related to, for example, applying for allowances from the NER and for the approval of domestic offset projects and the issuance of allowances in return for verified emission reductions. 3. Review the institutional capacity and expand institutions if needed. 4. Biomass obtained from renewable sources, like waste biomass, are not considered carbon neutral under the Kaz ETS. When defining types of biomass which can be considered carbon neutral, the Kaz ETS could incentivise the use of biomass in cement kilns. 	The policies should be predictable and stable (1).
8	ETS: Identify and develop options for linking	Continue searching for options to link with other ETS schemes, in particular with the EU ETS. Work closely with EU to establish Kazakhstan as a provider of acceptable allowance for the EU ETS. This will require the harmonization of requirements, notably for the MRV system used.	The policies should be predictable and stable (1).
9	ETS: Harmonise monitoring and calculation approaches	The government could encourage cement companies to use the protocol from the Cement Sustainability Initiative, and in the short term encourage companies to participate in the free-of-charge initiative "getting the numbers right" initiative from the WBCSD. ⁷¹ Since many emission trading schemes outside Kazakhstan follow the same principles, this will ease future linking.	The policies should provide incentives based on objective emissions and real or recent production levels (2), while avoiding market distortions (4).
10	Encourage clinker substitution	Revise building standards to allow, and encourage, clinker substitution. The building standards in Kazakhstan limit the ability of construction companies to use blended cements. In result, the demand for blended cement is limited. The government could align the quality requirements for cement in the construction standards with international best practices and, in parallel, stimulate the demand for blended cement in its own public procurement. In theory, European norms could act as a basis for a revision of these standards, while bearing in mind earthquake risks and building habits in Kazakhstan.	The policies should remove barriers to investment in low-carbon development (5).
11	Encourage energy efficiency	Energy efficiency can be encouraged by the Kazakhstan ETS and by energy pricing policies. Higher energy prices would encourage companies to invest in energy efficiency measures, including waste heat recovery.	The policies should remove barriers to investment in low-carbon development (5).
12	Encourage co-combustion of waste	<p>Encourage solid waste management and adopt regulations for the co-combustion of waste in cement kilns, bearing in mind:</p> <ol style="list-style-type: none"> 1. Cascading: consider re-use and recycling before opting for combustion, 2. Air emissions: consider reviewing the EU legislation which allows for co-combustion of waste if air emission limits are respected. <p>Kazakhstan could adopt the approach from the EU, where co-combustion is subject to air emission limitations, or the approach from Turkey, where only a selection of materials can be co-combusted.</p>	The policies should remove barriers to investment in low-carbon development (5), and safeguard environmental integrity (6).
13	Train experts to identify investment opportunities	The policy mix which targets clinker substitution, co-combustion of wastes and energy efficiency measures will incentivize low-carbon investment. Representatives from cement companies and audit companies, which undertake the compulsory periodic audits, can be trained to identify investment opportunities. These opportunities can relate to on-site investments in equipment, but also to the identification of waste streams or clinker substitutes which are available at affordable transport costs.	The policies should remove barriers to investment in low-carbon development (5),
14	Optimise logistics	Optimising the logistics around cement, clinker substitutes and alternative fuels can reduce transport costs.	The policies should remove barriers to investment in low-carbon development (5),
15	Ease access to financing	<p>Use auctioning revenues and penalties collected from the ETS participants to ease access to financing for investments in energy efficiency measures in industry, including waste heat recovery.</p> <p>International financial institutions can support with the design of climate finance facilities and ensure their complementarity with existing financial instruments available to companies in Kazakhstan.</p>	The policies should remove barriers to investment in low-carbon development (5),

⁷¹ <http://www.wbcscement.org/index.php/key-issues/climate-protection/qnr-database>, site visited on 27 July 2016.

Policy Roadmap

#	Policy instrument or objective	Recommendations	Policy principles targeted
16	Train environmental inspectors and verifiers	Train the environmental inspectors and verifiers to improve the overall communication on environmental regulations and compliance. This should make the outcome of inspections more predictable as well as the impact investments have on the extent to which a plant complies. It should also improve the consistency of the outcomes of different inspections.	The policies should be predictable and stable (1) and remove barriers to investment in low-carbon development (5),

6.2 International support

The policy roadmap should complement existing programmes which support low-carbon development of the cement sector in Kazakhstan. Most of the existing initiatives target the Kaz ETS and its modalities for domestic carbon credit projects. The role for international donors in each of the regulatory reforms in the Policy Roadmap (Table 7) is identified based on the scope of their current support (Table 6).

Table 6: International support to climate policy and ETS design and implementation.

EBRD	Scoping study for carbon markets in Kazakhstan (2009)
	Support with political outreach, readiness, private sector engagement, registry, benchmarking, offsetting and linking under the Partnership for Emissions Trading in the EBRD Region (finalised in 2015).
	Developing a wind power project in compliance with the Kazakh domestic offset procedures (2015- 2017).
	Support to the Government of Kazakhstan in developing its INDC (finalised in 2016).
	Support to the Astana International Finance Centre (AIFC) in developing a Green Financial System, which includes a carbon market development and financial sector inclusion component (2016 – 2017).
USAID	ETS readiness assessment, capability mapping, technical and institutional capacity strengthening for ETS program management, offset registration and issuance, allocations, support with MRV, identifying emission reduction investment opportunities and pilot projects, training energy auditors on accreditation standards (ends in 2017).
Norway, Ministry of Foreign Affairs	Monitoring plan and guidelines, benchmarking, and a detailed review of the regulatory framework of the Kaz ETS. ⁷²
German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMU)	Developing the initial legal framework for the ETS, MRV and the national allocation plans, developing a top-down allocation plan based on sectoral development scenarios. ⁷³
Netherlands, Agency NL	Private and public sector preparation, including the identification of business opportunities (finalised in 2013).
World Bank PMR	Defining the scope of the Kaz ETS, improve the MRV framework, improve requirements for verification, support a transition to e-reporting. ^{74, 75}

⁷² Interview with Francois Sammut, Carbon Limits, 17 July 2015.

⁷³ Interview with Petra Opitz, DIW Econ, 15 July 2015.

6.3 Timeline and responsibilities

The timing of the support activities should be aligned with the regulatory process on the NAP for Phase III.

⁷⁴ PMR, Proposal for Targeted Technical Support to Kazakhstan, (2013), available at: <http://www.thepmr.org/system/files/documents/PMR%20Secretariat%20-%20Proposal%20for%20Targeted%20Technical%20Support%20to%20Kazakhstan.pdf>

⁷⁵ PMR, Presentation: Kazakhstan Emission Trading Scheme (KAZ ETS) Status and challenges of MRV, Aigerim Yergabulova, , available at: <http://www.thepmr.org/system/files/documents/18.0-%20KAZAKHSTAN%20presentation-kaz.pdf>

Policy Roadmap

Table 7 shows the timeline for NAP development and adoption, and the support activities proposed.

Policy Roadmap

Table 7: Timeline for the implementation of both planned and proposed regulatory reforms.

#	Regulatory reform	Years and quarters										Main institutions involved	Donor involvement
		2015		2016				2017					
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
	Presentation of NAP to stakeholders (Aug/Sep 2015)											Ministry of Energy/Zhasyl Damu	USAID/PMR
	Deliberation of the NAP with the government (Sep/Aug 2015)											Ministry of Energy/Zhasyl Damu	
	Final NAP (Nov 2015)											Ministry of Energy/Zhasyl Damu	USAID/PMR
	Cabinet decision on the NAP (1 Dec 2015)											Ministry of Energy/Zhasyl Damu	
	Revision of the Ecological Code and its by-laws											Ministry of Energy/Zhasyl Damu	
	Develop emission scenarios per sector to support benchmarking and national reporting											Ministry of Energy	EBRD/BMU
	Pioneer the domestic offset procedures											Ministry of Energy	EBRD/USAID
1	ETS: Align ambition											Ministry of Energy/Zhasyl Damu	
2	ETS: Move to benchmarking, including a stakeholder consultation process											Ministry of Energy	USAID/PMR
3	ETS: Adopt market regulations											Ministry of Energy	USAID/PMR
4	ETS: Adopt partial auctioning											Ministry of Energy	Tbc (AIFC?)
5	ETS: Streamline the access to the NER											Ministry of Energy/Ministry of Finance	tbc
6	ETS: Streamline the use of domestic offsets											Ministry of Energy	EBRD/USAID
7	ETS: Review regulatory framework and procedures, build capacity											Ministry of Energy	EBRD/USAID/PMR
8	Identify and develop options for linking											Ministry of Energy	EBRD
9	Encourage clinker substitution											Ministry of Energy	
10	Encourage energy efficiency											Ministry of Energy	EBRD/USAID/World Bank
11	Encourage co-combustion of waste												
12	Train experts to identify investment opportunities											Ministry of Energy/Ministry for Investment and Development	EBRD/IFC/USAID
13	Ease access to financing											Ministry of Energy/Ministry for Investment and Development/Ministry of Finance	EBRD/World Bank
14	Train environmental inspectors											Ministry of Energy	
15	MRV											Ministry of Energy	EBRD/IFC

	Activities in the past
	Activities planned
	Activities recommended

Annex 1: Benchmark approaches

Benchmark Approaches in Kazakhstan

Benchmark approaches have been considered for the allocation of allowances to the cement sector in Kazakhstan for the 2016-2020 compliance period. Both the World Bank Partnership for Market Readiness (PMR), together with Carbon Limits, and USAID, together with Tetra Tech have supported the development of cement sector benchmarks.

In April 2015 Carbon Limits proposed different benchmarks for white and grey cement clinker for Kazakhstan. White cement is produced for applications where grey cement is considered less aesthetic. The production process of white cement is different to grey cement in terms of the raw materials used, kiln temperature and cooling process.

For both types of cement, the compliance effort which is required in the EU was used as reference in the calculations by Carbon Limits. The average emission level of grey cement clinker production amongst cement companies in the EU ETS is sector-wide 0.865 tCO₂e/t grey cement clinker. With a cement benchmark of 0.766 tCO₂e/t grey cement clinker, adopted for the EU ETS, the cement industry in the EU would need to reduce its emissions by 11%. The emission level of clinker production for grey cement in Kazakhstan was estimated at 1.08 tCO₂e/t grey cement clinker. Based on the principle of comparable effort, Carbon Limits proposed a benchmark which also requires an 11% efficiency improvement in Kazakhstan. The proposed benchmark level is, 0.962 tCO₂e/t grey cement clinker.

For white cement the recommendations from Carbon Limits were to match the benchmark level in the EU of 0.987 allowances per tonne of white cement clinker. Only the Sastobe plant is producing white cement in Kazakhstan.⁷⁶ This plant produces at an efficiency of 0.91 tonne of CO₂ per tonne of white cement clinker, which is already below the EU benchmark.⁷⁷

In 2015 also the USAID-funded research undertaken by Tetra Tech recommended applying a benchmark approach for the allocation of allowances to ETS participants. Tetra Tech pointed out that benchmarking would simplify the allocation and provide stronger incentives for energy efficiency improvements. Their analysis of the cement sector found that the

⁷⁶ Saunders, A., Global Cement Magazine-White Cement Review (2014), available at: <http://www.globalcement.com/magazine/articles/890-white-cement-review>.

⁷⁷ World Bank, Partnership for Market Readiness, Allocation of carbon emission allowances for specific sectors in Kazakhstan Sector note 3: Product benchmark for production of grey cement clinker in Kazakhstan, April 2015.

World Bank, Partnership for Market Readiness, Allocation of carbon emission allowances for specific sectors in Kazakhstan Sector note 4: Product benchmark for white cement clinker in Kazakhstan, April 2015.

Annex 1: Benchmark approaches

emissions from wet cement plants ranged from 1.1 to 1.4 tCO₂e/t clinker and for dry cement plants 0.83-1.0 tCO₂e/t clinker. They recommended an allocation based on:

- A benchmark level of 1,057 tCO₂e/t clinker which is based on the sector-wide average carbon intensity of clinker production through the wet and the dry cement production process.⁷⁸
- Applying a “50 to 50” approach to issuing allowances, whereby 50% of the allowances are issued for free and the remainder can be obtained through auctions or by developing projects which generate certified carbon offsets.
- Annual recalculation of the allocation based on last year’s production level, which is multiplied with the benchmark. The benchmark is fixed for the compliance period.

⁷⁸ USAID Kazakhstan Climate Change Mitigation Program, Fundamentals of national quota allocation plan in the Republic of Kazakhstan, Information note, (Astana 2015)

Interview with Alexei Sankovski (Chief of Party, Tetra Tech, Consultant for USAID, Kazakhstan Climate Change Mitigation Programme (KCCMP) and Aleksey Cherednichenko (Carbon Market Expert), on 9 July 2015.