

水泥行业 CO₂ 统计与报告 (CO₂ MRV for Cement Sector)



目录 (Agenda)

- **概述 (Overview)**
- **统计边界 (System Boundary)**
- **数据统计及计算(Data Collection and Calculation)**
- **指标对比 (KPIs and Its Message)**

概述 (Overview)



- 在全球通过各种碳交易及法规来引导节能减排的背景下，高能耗的行业对其资源效率及碳排放情况的数据收集已经成为了**必然**

In the global context of emission trading and various carbon reduction regulations, data collection and tracking of resource efficiency is becoming a MUST

- 水泥可持续倡议组织的CO₂ 统计与报告标准是目前为止在水泥行业最为通用的。每年全球超过900个水泥工厂以此标准来核算碳排放量，并录入GNR 数据库，作为制定行业标准奠定了坚实的基础

WBCSD-CSI CO₂ protocol is the most widely adopted standard in cement sector used for carbon MRV. Over 900 cement plants account their emissions according to it. All data goes to GNR database annually, of which forms the solid foundation for sectorial level benchmarking.

概述 (Overview)



- 各种水泥行业的碳排放标准均在酝酿中。至关重要的是，如何保证各地核算标准的一致性，以保证核算结果的可比性，是进行碳交易的根本问题。

Various carbon accounting standards are under development. However, it's significant to keep the consistency in between, so to ensure the comparability of the data afterwards. This is the fundamental question for the emission trading.

- 华新-豪瑞公司将CSI CO₂ 统计与报告标准融合进豪瑞会计与报告准则的要求中，对水泥生产全过程中的能源与资源消耗情况进行月度报告、和年度技术审核。所收集的CO₂数据均有第三方的审核，在每年公司社会责任（CSR）报告中对外披露。

Huaxin-Holcim imbedded the CSI CO₂ protocol into its accounting systems for CO₂ data collection, tracks the progress on both monthly report and annually technical review. Data are externally verified and communicated to all stakeholders.

统计边界 (System Boundary)



- 碳排放分两种：直接排放和间接排放

Two types of emissions: Direct emissions and Indirect emissions

- 对生产统计而言，直接排放是可控范围，往往作为数据收集和碳交易的基础

Direct emissions is the part “controllable” by the company, so normally used as the basis for data collection and emission trading

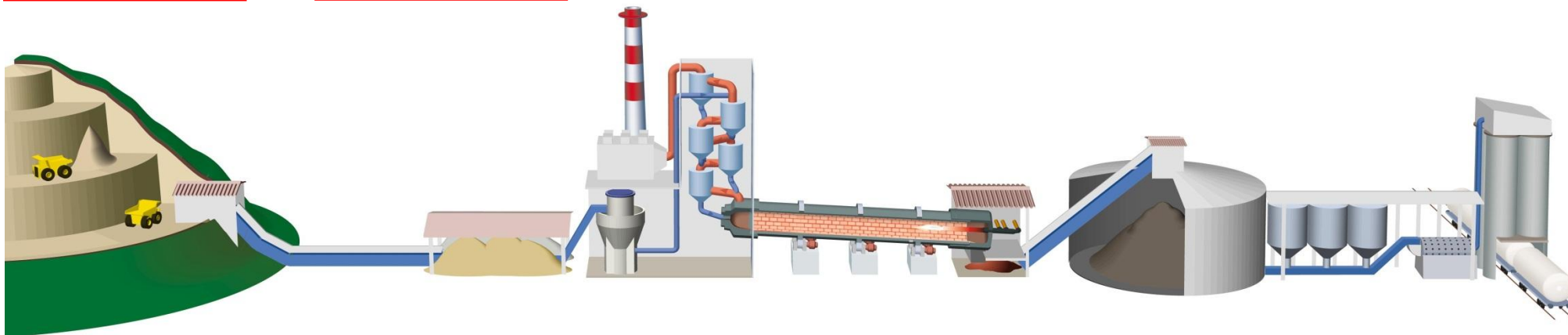
矿山采集及运输
(Quarry extraction and
raw material transport)

生料及燃料干燥
(Drying of raw
materials & Fuels)

窑用燃料及煅烧(Kiln
fuels and Calcination
process)

混合材干燥
(Drying of MIC)

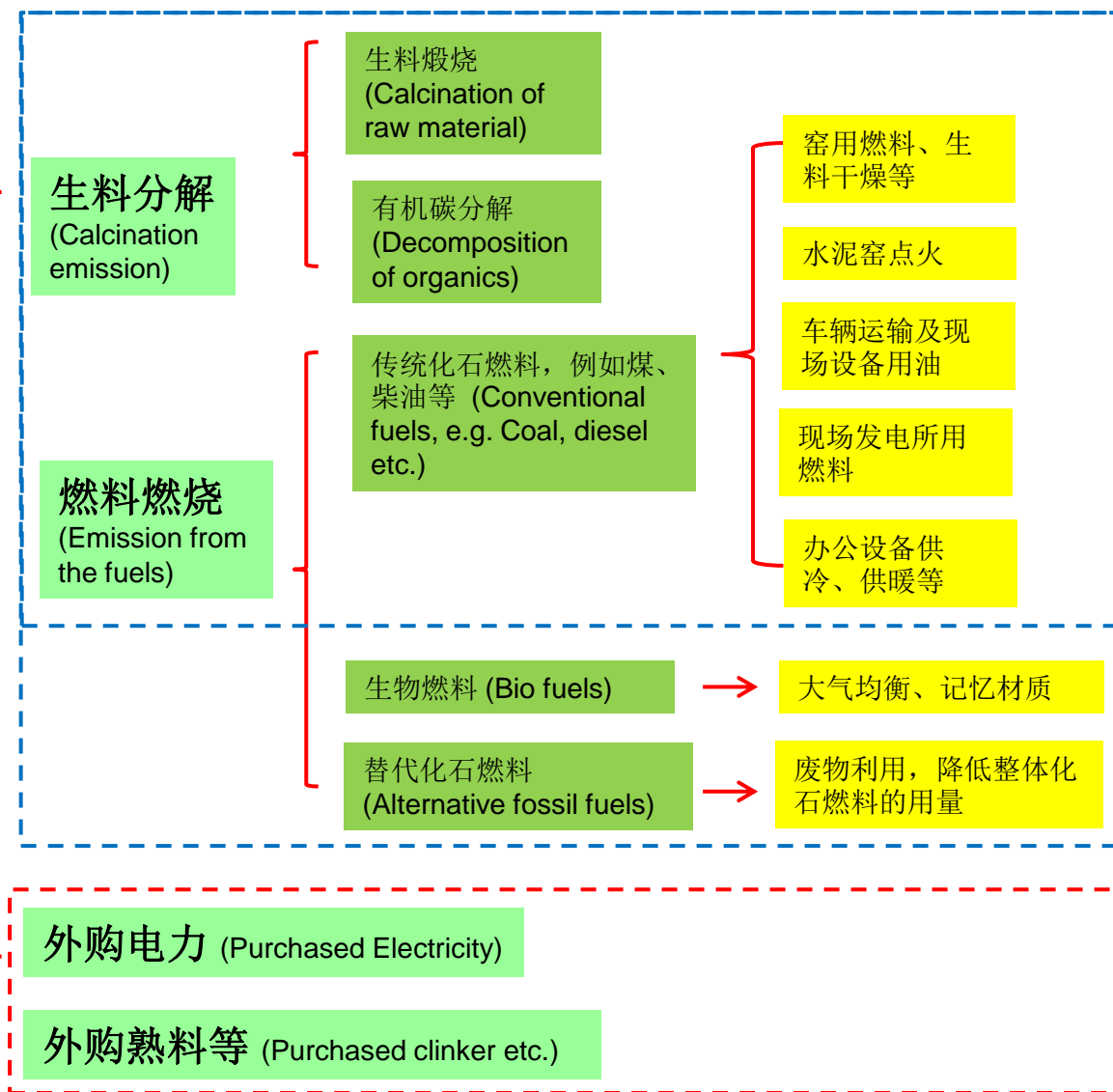
粉磨及搅拌
(Grinding &
Blending)



统计边界 (System Boundary)



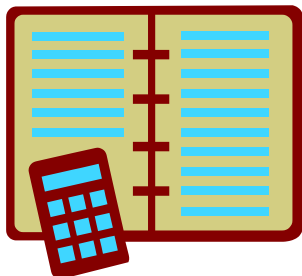
统计边界
(System Boundary)



直接排放
(Direct Emissions)

间接排放
(Indirect Emissions)

数据统计与计算 (Data collection & calculation)



生料分解-采用熟料法计算

Raw material calcination – Calculated based on clinker production

生料煅烧产生CO₂排放量 = 熟料产量*工厂排放系数 (默认系数525)

CO₂ from raw material calcination = clinker volume * plant specific emission factor (or default 525)

生料中有机碳产生CO₂排放量=熟料产量*1.55*0.002*3.664

CO₂ emission due to organic carbon in the raw material
= Clinker volume * 1.55 * 0.002 * 3.664

系数来自CSI
CO₂统计与报
告标准 3.0

Default value
based on CSI
CO₂ protocol
Ver 3.0

熟料产量来源于生料喂料量反推（默认生料与熟料比为**1.55**，工厂根据实际进行调整）

Clinker volume could be back calculated based on feed-in raw materials (default raw material/clinker ratio is 1.55, adjustable based on plant specific conditions)

数据统计与计算 (Data collection & calculation)



燃料燃烧 (Emissions from Fuels)

燃料燃烧产生CO₂排放量 = \sum 燃料消耗量 * 燃料发热值 * 单位热值排放系数

CO₂ emission from fuels = \sum Tonnage of fuel consumed * LHV per ton *
Emission factor per energy content

燃料消耗量 (Fuel tonnage): 工厂现场测量 (Measured on site)

燃料发热值 (Fuel LHV): 默认值或者化验室测算 (CSI default values or lab tests)

排放系数 (Emission factors): IPCC 数据 (Reference from IPCC)

生物燃料碳及混合燃料中含有的生物质成分，均被默认为是碳中和的。

Biomass and bio-content in mixed fuels are counted as carbon neutral.

替代化石燃料因可降低传统化石燃料的用量，其应用应得到鼓励。

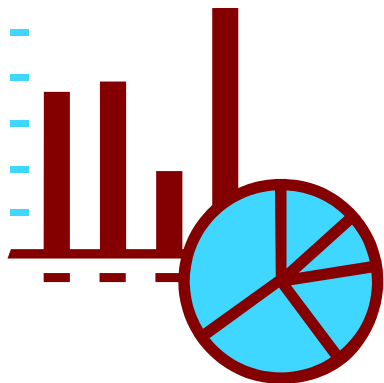
Alternative fossil could replace the usage of traditional fossil, should be encouraged in the system.

外购电力 (Purchased Electricity)

电力消耗产生的间接CO₂排放 = 电力消耗量 * 区域电网基准线排放因子

CO₂ from purchased electricity = Power volume * EF of the grid

指标对比 (KPIs and Its Message)



■ 年排放总量 (Absolute Emissions)

- ▶ 绝对毛CO₂排放量 = 生料分解产生CO₂ + 燃料燃烧产生CO₂
Absolute Gross Emissions = Calcination Emission + Fuel Emission
- ▶ 绝对净CO₂排放量 = 绝对毛CO₂排放 - 替代矿物燃料产生的CO₂
Absolute Net Emissions
= Absolute Gross Emissions – Emissions from Alternative Fossil Fuels

■ KPI-单位胶凝材料CO₂排放 (Specific Emissions)

- ▶ 单位胶凝材料累计毛(净)排放量 = 绝对毛(净)CO₂排放量 / 胶凝材料总量
- ▶ Specific Emissions = Absolute gross (or net) / Volume of Cem Pro

胶凝材料总量 = 熟料产量 + 水泥产量 (不含矿粉) × (1 - 熟料系数) + 矿粉产量

Cem Pro = Clinker + Cements (exl. MIC) * (1 - Cli factor) + MIC

指标对比 (KPIs and Its Message)

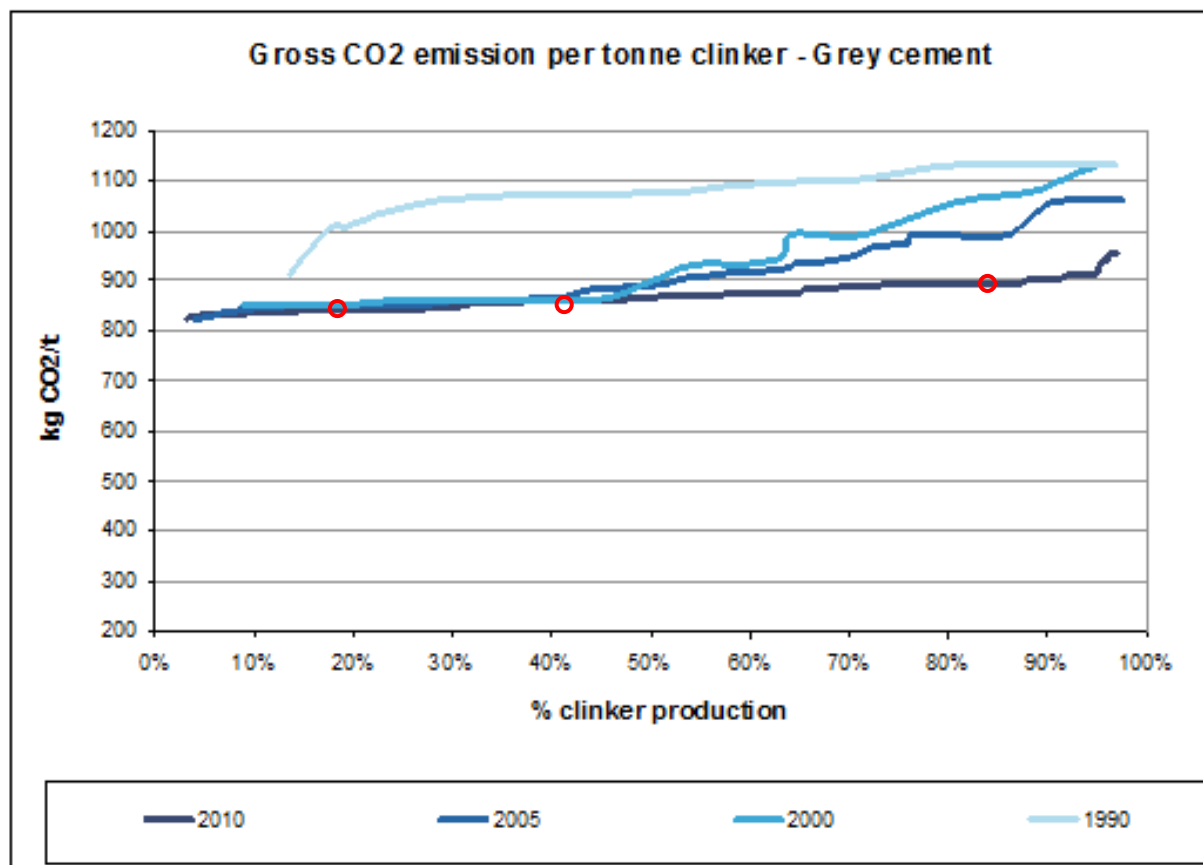


CSI - "Getting the Numbers Right"

Year: 2010

Region: China

Company: All GNR participants



问题？

