WORLD CEMENT ASSOCIATION

PROFESSIONAL COMMITTEES REPORT
WCA General Assembly

专业委员会工作报告

9th December 2021
2021年12月9日

Committee Restructure
委员会架构

Professional Committees in 2020:

- Technology & Innovation
- Safety & Health
- Environment & Climate Change
- Marketing & Logistics

Professional Committees in 2021

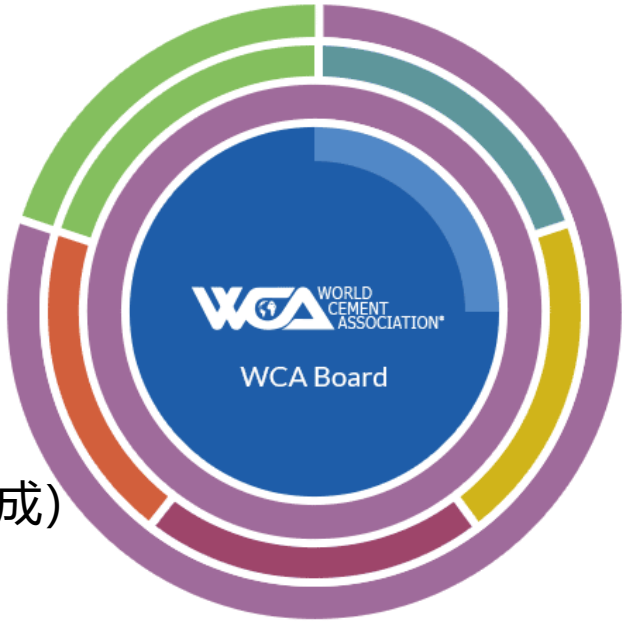
- Zero Carbon Steering committee of WCA directors
- Technology & Sustainability Steering Committee
- Safety & Health Committee
- Zero Carbon & Environment
- Product, Materials & Concrete
- Industry 4.0
- Operations & Performance

2020年专业委员会分为：

- 技术与创新委员会
- 健康与安全委员会
- 环境与气候变化委员会
- 市场与物流委员会

2021年专业委员会改组为：

- 零碳指导委员会（由WCA执委组成）
- 技术与可持续发展指导委员会
- 健康与安全委员会
- 零碳与环境委员会
- 产品、材料与混凝土委员会
- 数字化与工业4.0委员会
- 运营与绩效委员会



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Technology & Sustainability Steering Committee
技术与可持续发展指导委员会

- The committee are working on creating the agreed technology roadmap for decarbonisation.
  - The Decarbonisation Assistant (DECASS) tool.
- The first draft for the data collection document for the roadmap has been created and is being tested by a select group of members
- The working group will review feedback on the document from the members and revise the tool
- 目前，正在制定《WCA脱碳技术路线图》。
  - 脱碳辅助工具（DECASS）。
- 委员会已编写“路线图数据收集文件”，目前由指定成员进行审查。
- 委员会将根据会员反馈，修改“脱碳辅助工具”。

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Purpose and scope of the committee
委员会目标及工作范围

Purpose 目标

- Focusing on the industry response to climate change and other environmental challenges, such as biodiversity loss and water management. It also enhances members' opportunities to learn about new environmental technology, offers technical consultations and guidance, and stimulates sharing of best practices that promote sustainable development in the worldwide cement industry.
- 重点关注生物多样性损失、水资源管理等气候变化和环境挑战问题。为会员企业提供机会，了解新的环境技术，提供技术咨询和指导，鼓励分享促进全球水泥行业可持续发展的最佳实践。

Scope 工作范围

- Cement plant technology and practices that can reduce carbon footprint
- Develop WCA position on 'green' regulations
- Certification issues related to climate change
- 水泥厂减碳技术及实践
- 制定WCA关于“绿色发展”规范的立场
- 气候变化相关问题认证

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Committee actions
委员会行动计划

- The committee will support the implementation of the WCA climate policy
- The committee agreed to request members comments on relevant topics they would want to share with other members and topics they would be interested in hearing more on.
- The suggested topics are being reviewed and prioritised into a schedule of virtual member forums. Topics include:
  - Operational improvement programs to reduce costs and CO2 emissions
  - Alternative fuels and biomass introduction
  - Carbon capture projects
  - Co-process of hazardous wastes
  - Holistic energy planning and design for a cement plant
- 委员会将为《WCA气候政策》实施提供支持。
- 委员会商定，请会员企业提出希望与其他会员企业交流、分享的议题。
- 委员会将审核会员列举的议题，根据优选议题设定在线会员活动时间表，包括：
  - 改善运营，降本减碳
  - 替代燃料和生物质材料
  - 碳捕捉项目
  - 危险废物协同处理
  - 水泥厂整体能源规划与设计

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Product, Materials & Concrete Committee
产品、材料与混凝土委员会

- **The committee have identified 8 topics of interest for members which will be run as individual member forums:**
  - **Curing concrete with CO2 to reduce the carbon footprint**
  - **Upgrading of cementitious materials or new cementitious materials eg.LC3**
  - Trends in what architects and construction specialists are looking for
  - Belitic cement
  - Measuring embedded carbon in materials
  - **Including the carbon footprint of the entire process including the process of capturing and storing carbon, or calcining limestone**
  - 3D printed concrete
  - Substituting different types of reinforcement eg. fibre reinforcement
  - Geopolymer concrete
- **委员会选出了8项会员感兴趣的议题，可用于组织会员活动：**
  - **二氧化碳固化混凝土，减少碳足迹**
  - **胶凝材料升级或新胶凝材料，如LC3水泥**
  - 建筑师及专家关注的行业发展新趋势
  - 贝里特水泥
  - 测量材料中的隐含碳
  - **全生产过程碳足迹，包括碳捕捉及封存过程，或煅烧石灰石过程**
  - 3D打印混凝土
  - 替换不同类型的钢筋，如碳纤维
  - 地聚合物混凝土

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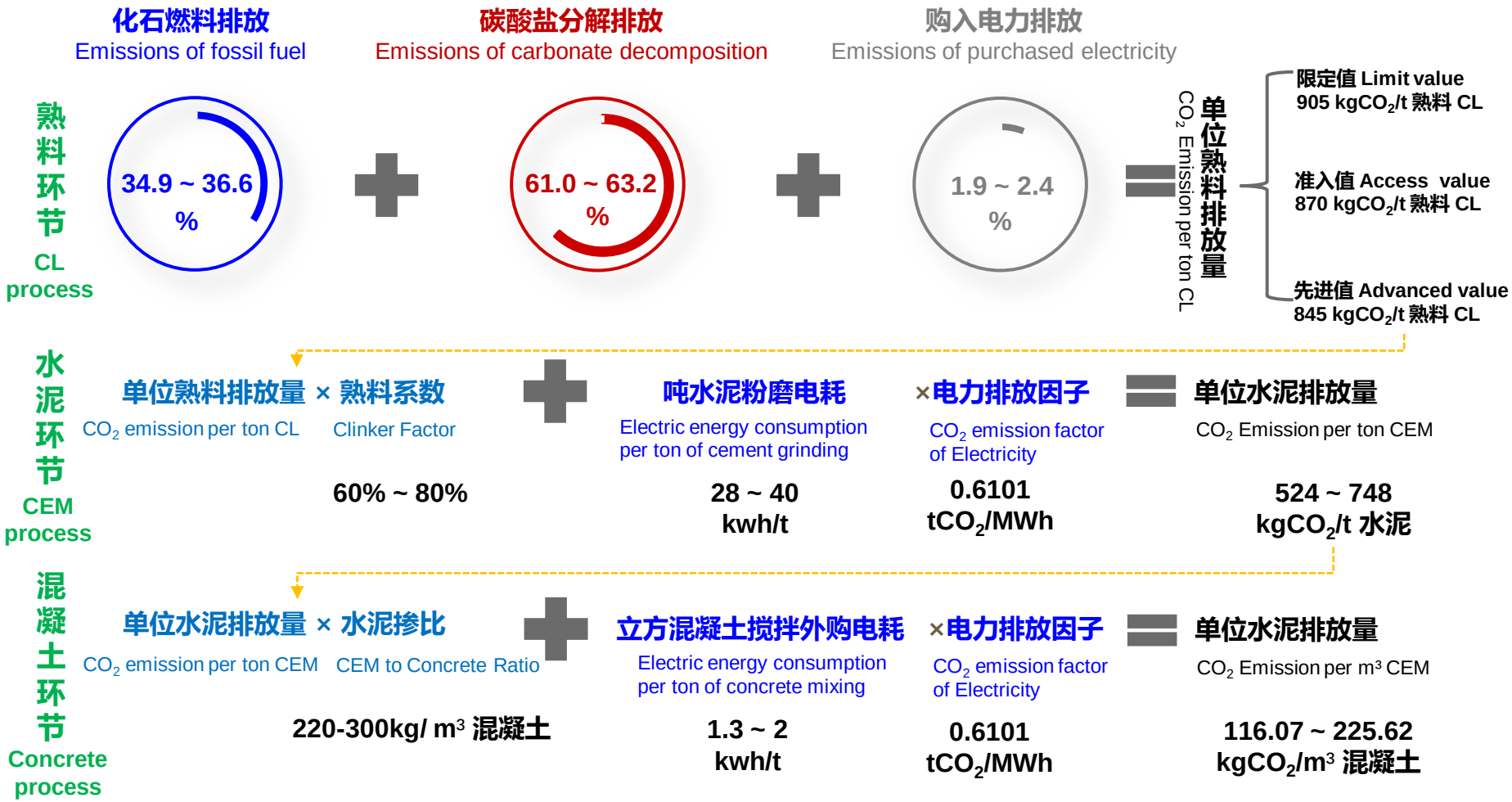
Carbon footprint of clinker, cement and concrete production processes
熟料、水泥和混凝土全生产过程碳足迹



参考《硅酸盐水泥熟料单位产品碳排放限额》，不考虑余热发电因素

Refer to < The norm of CO_2 emission per unit products of Portland cement clinker>, without considering the factor of waste heat power generation

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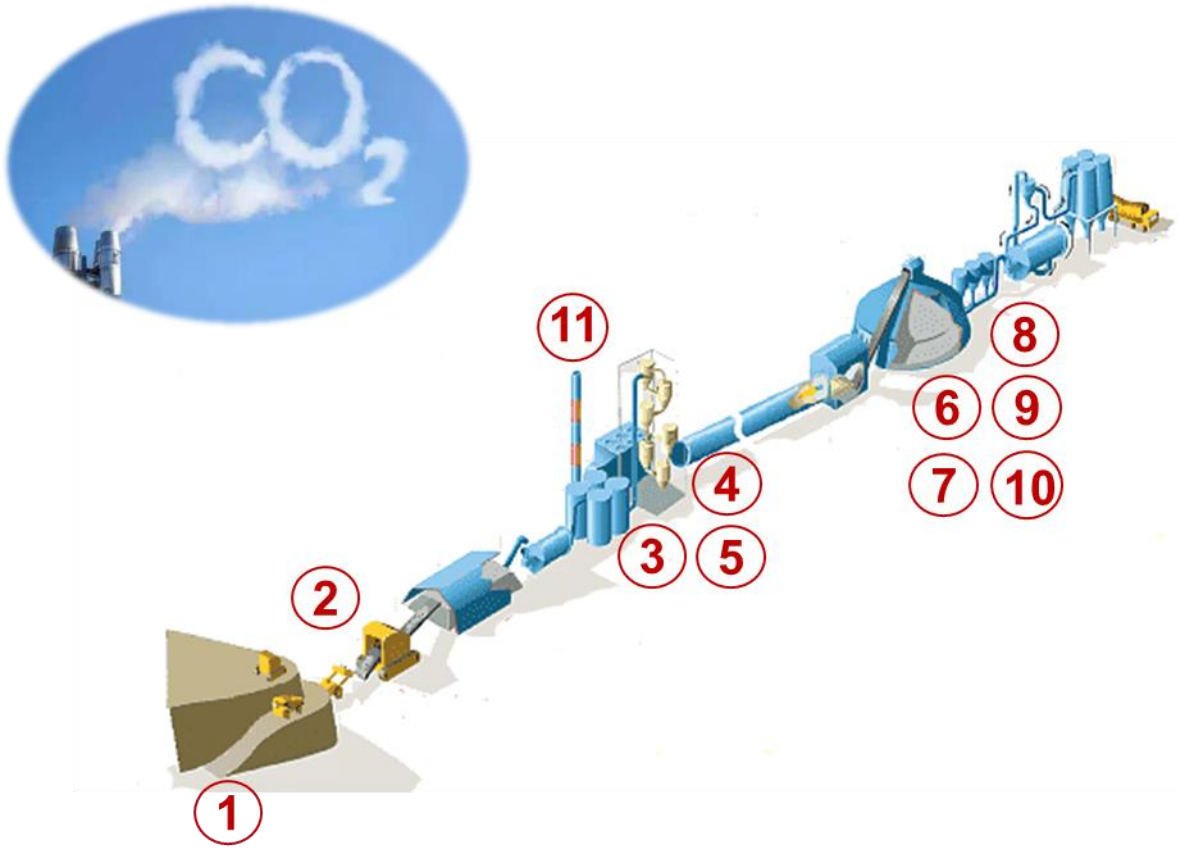
Initiatives of traditional cement industry to lower carbon
传统水泥工业的低碳化举措



序号 No.	技术路径 Technical measures	碳减排潜力 Carbon reduction potential（$kgCO_2/t.cl$）	
		低位 low level	高位 high level
1	绿色矿山 Green quarry	0.1	0.3
2	替代原料 Alternative raw materials	4	7
3	替代燃料 Alternative fuels	140	285
4	燃料效率 Fuel efficiency	20	50
5	余热利用 Waste heat use	30	45
6	熟料利用系数 Clinker factor（$kgCO_2/t.cem$）	120	170
7	低碳熟料开发Low carbon clinker development	40	70
8	能源利用率 Energy efficiency	6	10
9	智能工业系统 Intelligent industrial system	5	10
10	新型能源开发利用 Development and utilization of new energy	30	60
11	碳捕集与利用 CCU/CCUS	160	350

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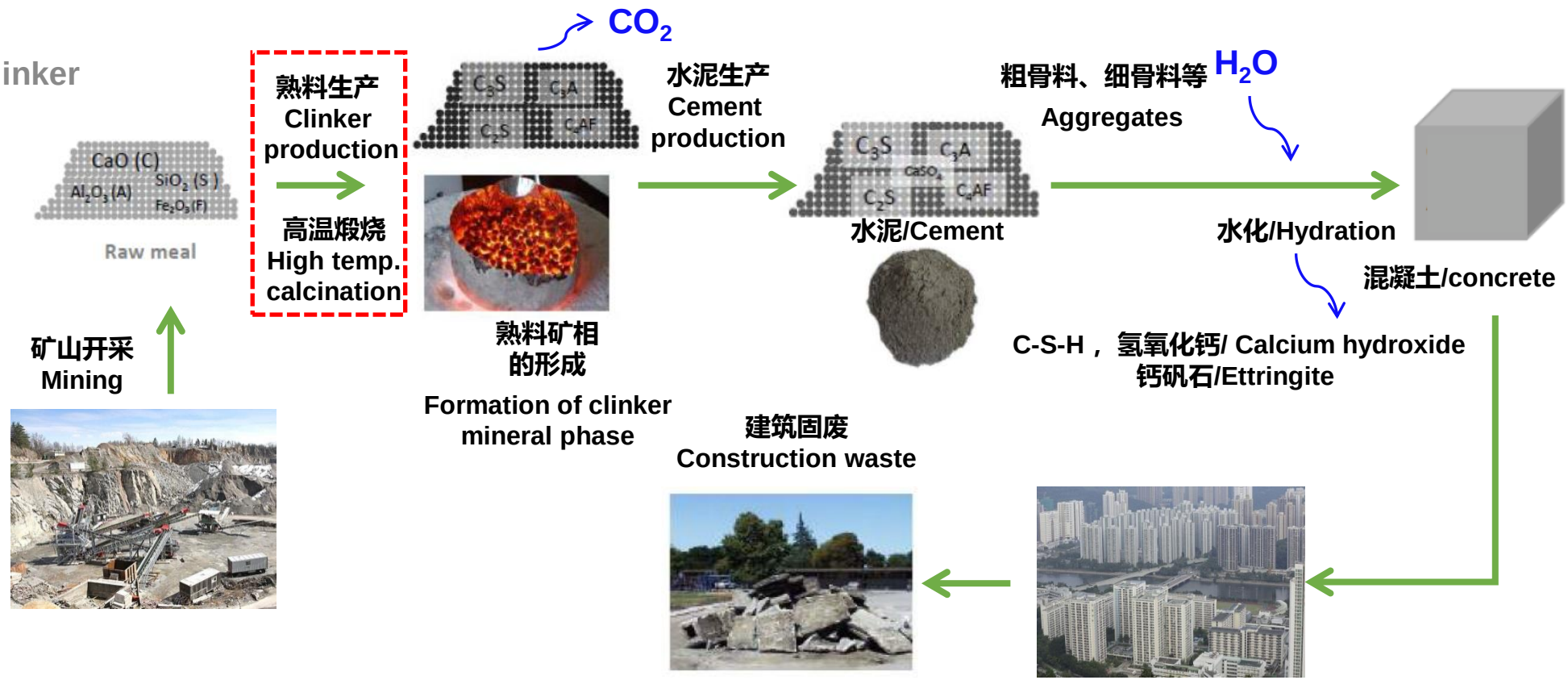
New cementitious materials
新型胶凝材料

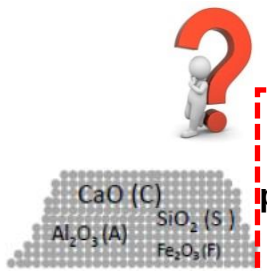
低碳熟料
Low carbon clinker



利用低碳熟料和新型胶凝材料的研发减少二氧化碳的排放

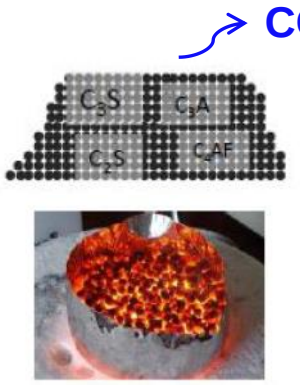
Use low-carbon clinker and develop new cementitious materials to reduce carbon dioxide emissions

New cementitious materials
新型胶凝材料



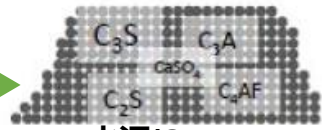
熟料生产
Clinker production

高温煅烧
High temp. calcination



CO_2

水泥生产
Cement production

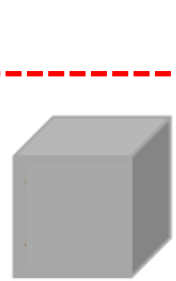


水泥/Cement

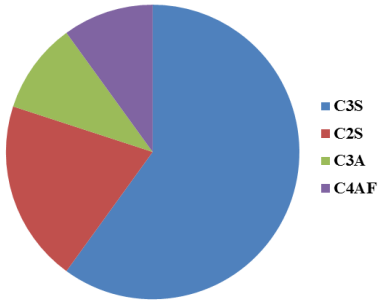
粗骨料、细骨料等
Aggregates

H_2O

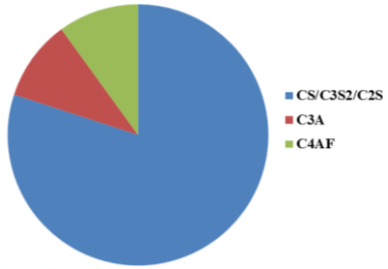
水化/Hydration



混凝土/Concrete



低碳熟料
Low carbon clinker



煅烧黏土
Calcined clay

火山灰反应
pozzolana reaction

水泥
Cement

协同效应
Synergy effect

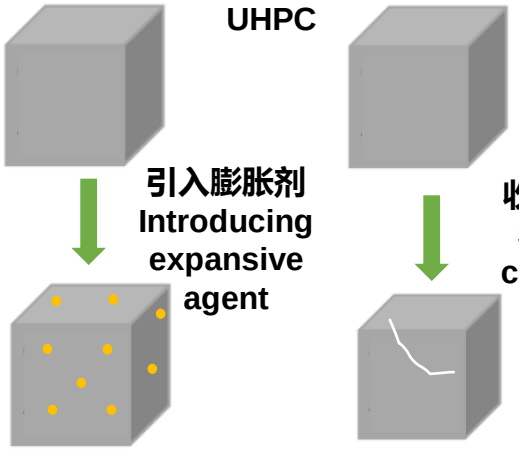
石灰石
limestone

LC3水泥
LC3 cement

超高性能混凝土
UHPC

引入膨胀剂
Introducing expansive agent

收缩开裂
Shrink cracking



膨胀剂/expansive agent

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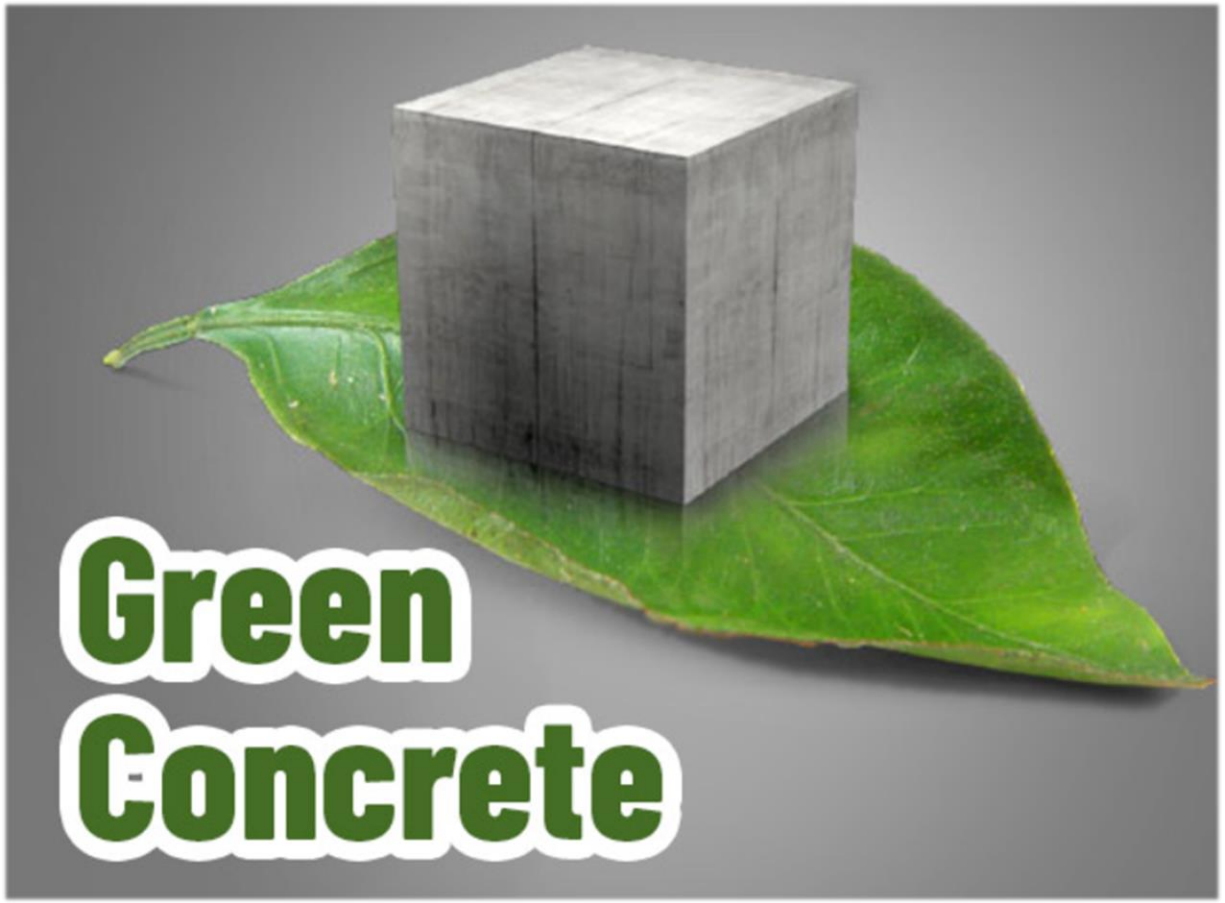
Green concrete
绿色混凝土



- **International technical application of carbonized concrete:**
  - Use fly ash, slag, aggregates, water and activator to produce geopolymer cement concrete (Joseph Davidovits);
  - Mineralization curing of concrete (Carboncure Technology);
  - Use steel slag instead of cement, mineralize and cure by injecting CO2, to produce precast concrete product (CarbiCrete);
  - CO2 mineralization recycled aggregate, mineralize and reinforce waste limestone or construction waste, so to produce concrete (Blue Plannet);
  - Calcining low calcium clinker, and CO2 curing technology (Solidia);
  - Other CO2 CCUS technologies.
- **国际上碳化混凝土的技术应用：**
  - 采用粉煤灰、矿渣、骨料、水和激发剂生产地聚物水泥混凝土（Joseph Davidovits）；
  - 混凝土的矿化养护（Carboncure Technology）；
  - 采用钢渣替代水泥，通过注入二氧化碳矿化养护制备预制混凝土制品（CarbiCrete）；
  - 二氧化碳矿化再生骨料，将废弃石灰石或建筑固体废弃物碳化增强后制备混凝土（Blue Plannet）；
  - 煅烧低钙熟料，并采用二氧化碳养护的技术方案（Solidia）；
  - 其他二氧化碳俘获、利用和储存技术。

Practice of green concrete
绿色混凝土实践

骨料一体化
Aggregate Integration

- 一体化矿山; integrated quarry;
- 矿石全利用; Full utilization of minerals;
- 高性能骨料; High performance aggregate;
- 特性匹配型骨料; Characteristics matched aggregate;
- 矿山智能修复 Intelligent restore of quarry;
- … …

减污、低碳
Pollution reduction, low carbon

- 可替代原燃料; AFR;
- 垃圾衍生燃料; RDF;
- 能源与生产效率; Energy & production efficiency;
- 低碳水泥; Low carbon cement;
- 碳捕捉与矿化; Carbon capture & mineralization;
- … …

混凝土一体化
RMX Integration

- 一体化原材料; Integrated raw material ;
- 补充胶凝材料; SCMs;
- 高性能混凝土; High performance concrete;
- 大宗材料运输; Bulk material delivery;
- 碳中和混凝土; Carbon neutral concrete;
- 绿色认证; Green certification;
- ……

数字一体化
Digital Integration

- 与物流调度优化生产; Production & delivery dispatch optimization;
- 质量监控; Quality monitoring;
- 碳足迹在线计算与监控; Carbon footprint online calculating & monitoring;
- AI;
- ……

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Digitalization & Industry 4.0 Committee
数字化与工业4.0委员会

- **The committee have identified the importance of standardisation of codes and definitions across the members for there to be meaningful benchmarking.**
- **A discussion document will be created on standard and definitions to share with a select group of members for feedback in a workshop.**
- 委员会认为会员企业编码标准化及定义对于会员企业智能化情况对标至关重要。
- 委员会商定，由委员会编制标准及定义文件，与选定会员企业分享，并召开会议进行讨论。

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Operations & Performance Committee
运营与绩效委员会

- The committee have reviewed and approved the end of phase 1 report for the PEGAUS benchmarking project.
- From the phase 1 report 3 best practice topics have been chosen to run as virtual events for members
  - Fan efficiency
  - Low pressure systems
  - Ball mill management/operations
- The events hosted by the committee will run 1 event a month starting in 2021.
- 委员会审批通过了WCA会员工厂对标、差异分析及巡检项目的第一阶段工作报告。
- 根据会员工厂对标、差异分析及巡检项目的第一阶段工作报告，委员会确定了3项最佳实践，可据此组织在线会员活动。
  - 风机效率
  - 低压系统
  - 球磨管理/操作
- 2021年11月开始，委员会每个月会组织1次活动。

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Safety & Health Committee

- The committee hosted various network meetings focussing Hazard Identification and creating health and safety awareness. Topics discussed: Energy Isolation and confined space working. Covid-19 management remains a key part of the engagement sessions
- 召开专家库会议，提高健康安全意识。议题包括风险识别、能量隔离、密闭空间等。疫情管理也将作为一项重要议题。
- The WCA Safety and Health committee plan to meet on a more frequent basis. Focussing on: 委员会计划就不同议题召开会议：
  - Industry specific hazard identification and mitigation
  - Sharing and developing cement manufacturing specific best practices
  - Improve incident management, analysis, learnings and provide guidance on corrective/preventative action
  - Establishing a database for Health and Safety information accessible to all members
  - Establish a platform for knowledge and skills transfer of health and safety management.
  - 风险识别、降低风险
  - 分享、开发最佳实践
  - 提高风险管理，进行分析、学习交流等；提供正确/防范行为指导
  - 建立数据库，供会员使用
  - 设立平台，转移技术、知识等

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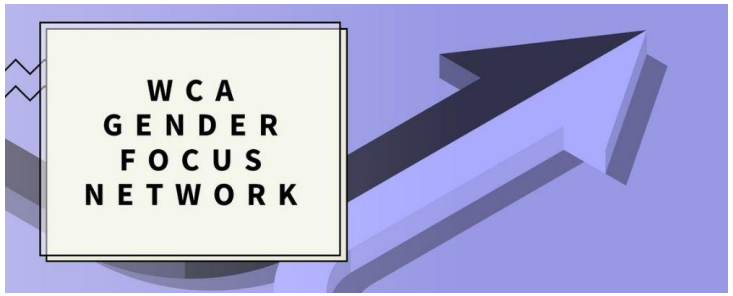
Gender Focus Network
性别焦点库



Manon Burbidge Interviewed by edie.net for International Women's Day

10 March 2021

edie.net

Manon Burbidge, WCA's Policy and Communications Coordinator, has been interviewed by edie.net in an International Women's Day special SustyTalk. They discuss WCA's new Gender Focus Network, the issues surrounding gender diversity in the industry, the barriers that prevent women entering cement and how they can be overcome.

- **Media and Awareness Raising**
  - International Women's Day podcast
  - MB interviewed for edie.net video on importance of integrating women's empowerment into sustainability efforts
  - MB quoted on need for recruitment of women and young talent to decarbonise cement industry in Cement Americas article on Sustainability.
  - MB authored article for CemNet on GFN
- **Meetings and LinkedIn Group for Network**
- **Promoting female speakers at WCA Events**
  - Open Day – 30% female speakers
  - Conference – 22% female speakers
- **Panel at WCA Open Day discussing key issues:**
  - "Embedding Gender Diversity at All Levels" - Supporting Women in the Cement Industry
- 媒体宣传 & 提高“女性赋权”意识
  - 国际妇女节播客节目
  - 码农·波比奇接受伊迪网采访，就加强女性赋权与可持续发展的关系发表观点。
  - 《美国水泥》文章引述码农·波比奇关于水泥行业应吸引更多女性及年轻人才进行脱碳的观点。
  - 《国际水泥评论》就WCA性别焦点库设立发文
- 性别焦点库会议、领英群
- WCA活动期间，邀请女性演讲嘉宾
  - 开放日活动—女性演讲嘉宾占30%
  - 年度大会—女性演讲嘉宾占22%

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