



# WELCOME

**Lafarge Public Meeting  
Evaluation of Low Carbon Fuels – Project 1  
Considerations for Permanent Use  
June 9, 2015  
7:00 pm – 9:00 pm**

Purpose of this meeting:

- Chance to meet representatives from Cement 2020 Task Force
- Share what we have learned
- Learn about the Environmental Screening process
- Opportunity for public to ask questions and help shape the project

# CEMENT 2020 UPDATE

## The Project in a Nutshell

- Long-term vision is to replace coal/petcoke with low carbon alternatives as the fuel source for the cement industry
- Cement 2020 is an industry research initiative led by Lafarge and includes the following partners:
  - Queens University
  - Natural Resources Canada (funding partner)
  - Ontario Centres of Excellence (funding partner)
  - Carbon Management Canada (funding partner)
  - Royal Military College of Canada
  - Natural Resources Canada
  - Pollution Probe
- The Evaluation of Low Carbon Fuels – Project 1 is the next step in the Cement 2020 initiative: Environmental Screening Process for three low carbon fuels (weathered treated wood such as railway ties and utility poles, construction and demolition materials, and asphalt shingles)
- Results are very encouraging; upon successful completion of the Environmental Screening Process, Lafarge will apply for permanent Environmental Compliance Approval to use these fuels indefinitely
- Lafarge is also exploring the use of other low carbon fuels and will complete additional testing and Environmental Screenings as applicable

# ENVIRONMENTAL ASSESSMENT PROCESS

## What is an EA?

Environmental assessment (EA) is a planning and environmental management tool that is used to predict, analyze and interpret the effects of a project on the environment and to identify the measures that will be used to avoid or otherwise mitigate anticipated adverse effects and/or enhance positive effects.

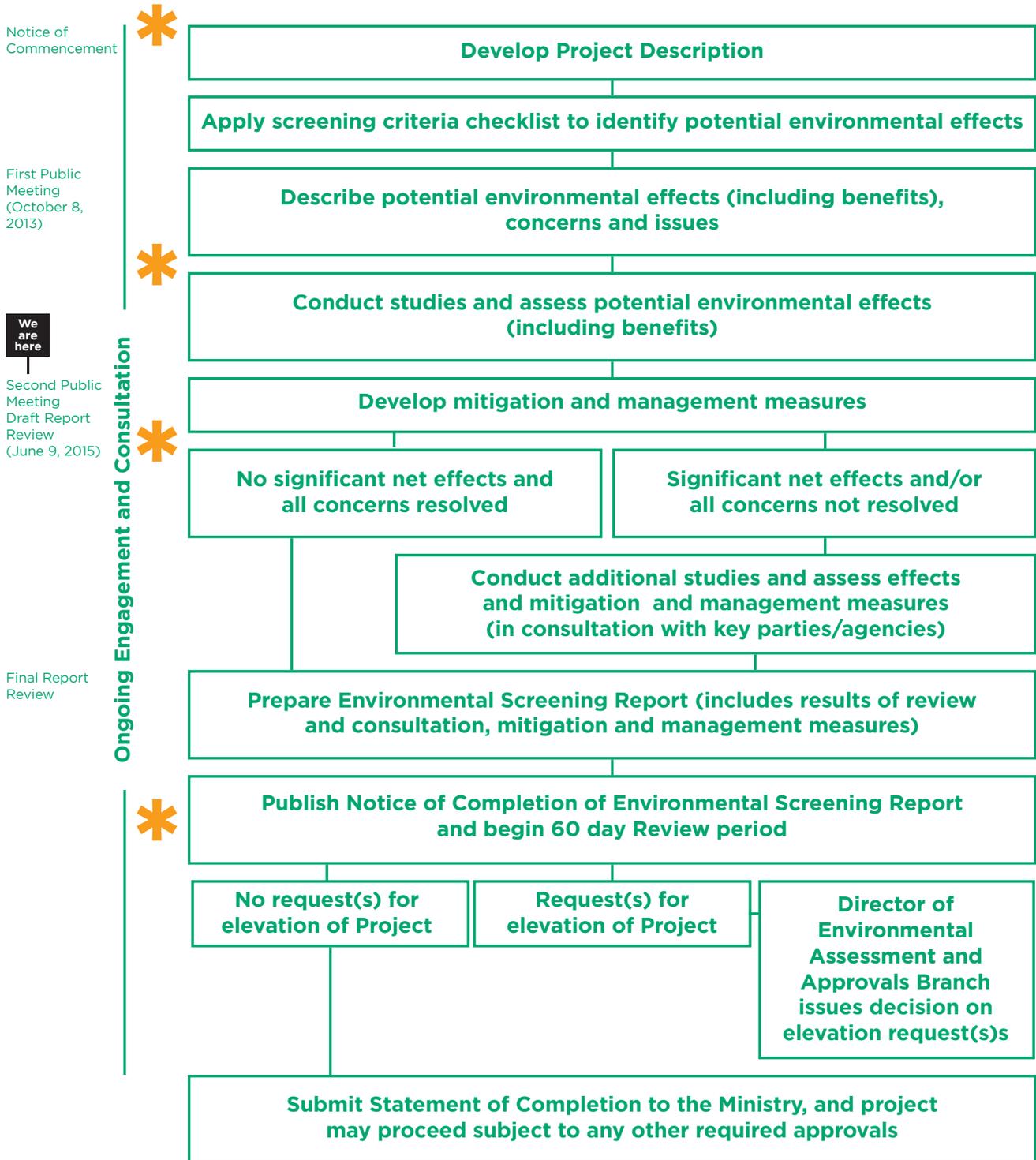
## What is the Environmental Screening process?

An Environmental Screening is a type of Environmental Assessment that requires proponents to identify and evaluate the potential environmental effects (including benefits) of their projects, consult with interested persons, and outline possible mitigation measures as required.

An Environmental Screening Process (ESP) applies to projects designated in Part III of the Waste Management Projects Regulation (Ontario Regulation 101/07) and falls under the Ontario Environmental Assessment Act.

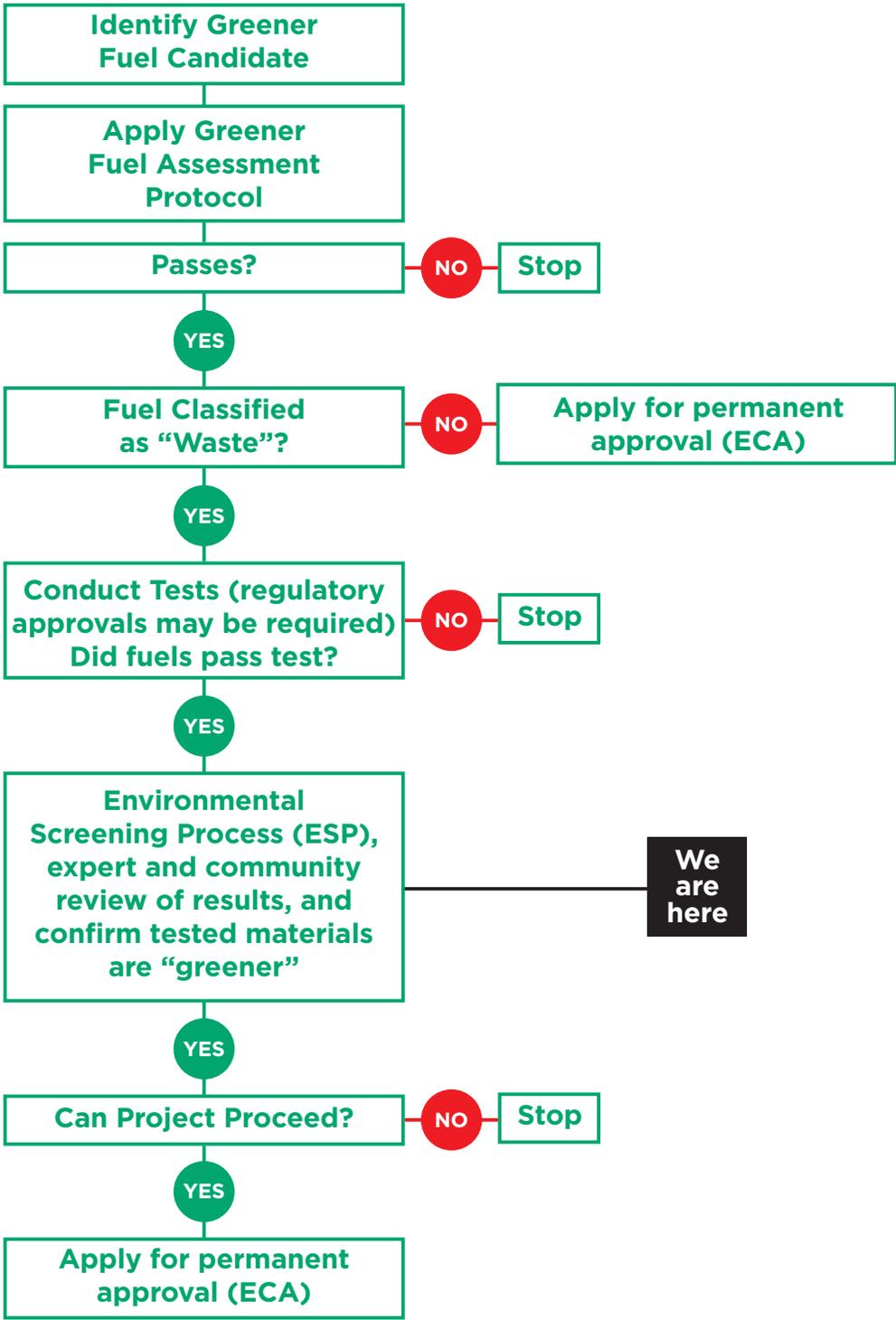
The ESP is used for projects which have predictable environmental effects that can be readily mitigated.

# ENVIRONMENTAL SCREENING PROCESS



\* Key Engagement/Consultation Milestones

# THE PRECAUTIONARY PRINCIPLE IN ACTION



# LOW CARBON FUELS PERMITTING HISTORY

Here is an overview of the types of fuels approved for use at the site and the regulatory approvals for each.

Project	Fuel Type	Regulatory Approval	Examples
Current Bath Plant Operation	Fossil-Fuels	Permanent Environmental Compliance Approval (ECA)	Coal, petroleum coke (petcoke), and natural gas
Energy Farm Demonstration Project	Virgin Biomass	Pilot Project ECA (November 2009 - 2012)	Switchgrass, Miscanthus grass, sorghum, hemp, trees (willows), and others
Permanent Low Carbon Fuel Project	Virgin Biomass (Purpose Grown and End of Life)	Permanent ECA (granted December 2012)	Wood, Miscanthus grass, millet, sorghum, hemp, switchgrass and maize
	N/A	Permanent ECA for fuel staging, processing and delivery system (granted December 2012)	N/A
Low Carbon Fuel Demonstration Project	Mixed Biomass	Pilot Project ECAs - 3 year term (granted December 2012 - term started December 2013)	Textiles, paper fiber, wood, plastic composite materials, construction and demolition materials, cardboard, banknotes disposable beverage cups, treated wood (i.e., railway ties and utility poles) and asphalt shingles
Evaluation of Low Carbon Fuels - Project 1	Mixed Biomass	Environmental Screening Process - underway Results are encouraging; upon successful completion of the Environmental Screening Process Lafarge will apply for permanent Environmental Compliance Approval to use these fuels indefinitely	Construction and demolition materials, weathered treated wood (such as railway ties and utility poles), and asphalt shingles

# MOST FREQUENTLY ASKED QUESTIONS\*

\*(AND WHERE TO FIND THE ANSWERS)

- A screening criteria checklist was completed by answering a series of “yes” or “no” questions to identify the potential for any effects (including benefits) on the environment.
- At the Public Meeting in October 2013 we asked for the public’s feedback on what types of environmental studies should be completed as part of the Environmental Screening Process.
- Based on your feedback, and the screening criteria checklist, the following studies were completed and site management plans (to be) revised:

Public Comments	Criteria	Studies
Concerned about air quality related to emissions, emission testing, odour and dust.	Air – emissions (e.g., temperature, exhaust, suspended particulates)	<ul style="list-style-type: none"> <li>• Source Testing Report – RWDI Air Inc.</li> <li>• Draft Emission Summary and Dispersion Modelling Report – RWDI Air Inc.</li> <li>• Draft Background Air Quality and Cumulative Effects Analysis – RWDI Air Inc.</li> <li>• Life Cycle Assessment Report (Queen’s University)</li> <li>• Draft Comparison of the Stack Emissions from the Combustion of Fossil Fuels versus the Mixture of LCFs and Fossil Fuels – Jamie Davis (Queens University) and John Chandler (Chandler and Associates)</li> </ul>
	Air – greenhouse gases (e.g., carbon dioxide, carbon monoxide, methane)	
	Air – dust	<ul style="list-style-type: none"> <li>• Fugitive Dust Best Management Practices Plan will be revised to include LCFs – Lafarge Canada</li> <li>• Site Housekeeping Plan will be revised to include LCFs – Lafarge Canada</li> </ul>
	Air – odour	<ul style="list-style-type: none"> <li>• Workers Health and Safety Plan will be revised to include LCFs – Lafarge Canada</li> </ul>
Concerned about noise.	Noise	<ul style="list-style-type: none"> <li>• Draft Acoustics Assessment Report – HBC Engineering</li> <li>• Draft Acoustics Assessment Briefing – HGC Engineering</li> </ul>
Concerned about traffic and community well-being.	Aesthetics	<ul style="list-style-type: none"> <li>• Draft Land Use and Socio-Economic Baseline and Effects Assessment Report – Golder Associates</li> <li>• Traffic Impact Study – GHD Inc.</li> </ul>
	Community services and infrastructure, including traffic	
	Economics	
	Neighbourhood or community character	
	Sensitive land uses within 500 metres from the site boundary	
Concerned about water quality, process water use and discharge.	Surface Water	<ul style="list-style-type: none"> <li>• Draft Surface Water Technical Study – Golder Associates</li> <li>• Draft LCF Shredding Pad Design – Golder Associates</li> <li>• The Surface Water Management Plan for the quarry will be revised to include runoff from LCF 1 – Lafarge Canada</li> </ul>
	Groundwater	<ul style="list-style-type: none"> <li>• Draft Groundwater Technical Study – Golder Associates</li> </ul>

Other public comments were received – Please ask us how your comments were addressed.

# PROJECT SITE LAYOUT



## Legend:

- LCF 1-5** --Areas used for Low Carbon Fuel Project
- LCF 1** --Fuel staging and processing area
- LCF 1-4** --LCF storage areas
- LCF 5** --Fuel Delivery System area

# THE RESULTS: SURFACE AND GROUND WATER

Criteria	Potential Effects	Results
<b>Surface Water</b>		
Surface water quality	<p>Increase in concentrations of one or more water quality parameters due to contact between surface runoff and LCF stockpiles</p> <p>Increase in suspended solids from dust generation and mobilization when in contact with surface runoff</p>	<p>Effects to surface water quality are predicted to be negligible. Processed LCFs will be stored under cover.</p> <p>Effects to surface water quality are predicted to be negligible. The Fugitive Dust Best Management Practices Plan and the Site Housekeeping Plan will be revised to include LCFs. A lined sump will be constructed at LCF 1 to collect surface water runoff.</p>
Surface water flow	Increase in peak flow volumes at LCF 1 due to the covered storage area	Effects to surface water flow are predicted to be negligible. A lined sump will be constructed at LCF1 to collect surface water runoff.
Surface water quantity and flow	Increase in drainage area and related flow volumes to the Stormwater Management Pond	Effects to surface water quantity and flow are predicted to be negligible.
	Decrease in drainage area and flow to the West Channel Drainage ditch	A moderate decrease in flow is predicted, but it is not considered significant as effects are limited to large rainfall or snow melt events that are of short duration and low frequency
<b>Groundwater</b>		
Groundwater quantity and flow	Groundwater levels and/or flow at nearby off-site private wells affected by LCF staging/processing area at LCF 1	No changes to groundwater quantity or flow are predicted.
Groundwater quality	Increase in concentrations of one or more water quality parameters due to contact between rainfall or snowmelt and LCF materials	Effects to groundwater quality are predicted to be negligible. Processed LCFs will be stored under cover. Groundwater in the vicinity of LCF1 would flow to quarry sump and be managed with surface water.
	Leaching from dust generated particles	Effects to groundwater quality are predicted to be negligible. The Fugitive Dust Best Management Practices Plan will be revised to include LCFs. Surface water runoff from LCF 1 would flow to a lined sump; excess surface water from the sump would be discharged to the quarry and managed in accordance with the Surface Water Management Plan.

# THE RESULTS: SOCIO-ECONOMICS AND LAND USE

Criteria	Potential Effects	Results
<b>Socio-Economics</b>		
Neighbourhood and community character	No effects to neighbourhood and community character were identified.	No effects are predicted. (See Socio-Economics Report)
Aesthetics	Increased visibility of traffic and litter from the transportation, shredding and storage of LCFs	Effects to community aesthetics are predicted to be negligible.  Lafarge will require LCFs to be transported using fully enclosed trailers, tarped dump trucks, or railcars. The Site Housekeeping Plan will be revised to include the LCF staging and processing operations, to ensure the site appears clean and orderly. LCF materials will generally be sorted inside a covered structure.
Local businesses, institutions and public facilities	No potential effects to local businesses, institutions or public facilities were identified.	No effects are predicted. (See Socio-Economics Report)
Recreation, cottaging and tourism	No potential effects to recreation, cottaging or tourism were identified.	No effects are predicted. (See Socio-Economics Report)
Community services and infrastructure, including traffic	No potential effects to police, and emergency services, health, education or social services, housing, water, wastewater, or waste services were identified.	No effects are predicted. (See Socio-Economics Report)
	Increased traffic	No effects on current traffic levels are predicted.  The Project will use approved traffic routes consistent with existing haul route designations. Haulers will refrain from using engine breaks and will comply with all Site safety requirements.
Economics	No effects to the local economic base were identified. Changes to local employment and labour supply will be negligible.	No effects are predicted. (See Socio-Economics Report)
<b>Land Use</b>		
Sensitive land uses within 500 metres from the site boundary	No effects to land use were identified; the Project is compatible with the existing land use designations and zoning by-laws.	No effects are predicted. (See Socio-Economics Report)

# THE RESULTS: AIR QUALITY AND NOISE

Criteria	Potential Effects	Results
<b>Air</b>		
Emissions (e.g., temperature, exhaust, suspended particulates)	Increased concentrations of one or more parameters from the combustion of LCFs	No change in emissions after scientific review. See Queen's Emission Evaluation report.
Greenhouse gases (e.g., carbon dioxide, carbon monoxide, methane)	Increased concentrations of one or more parameters from the combustion of LCFs	Carbon emissions decreased by over 70% for every tonne of coal & petcoke replaced. See Queen's Life Cycle Assessment report.
Dust	Increased dust from shredding operations	Effects are predicted to be negligible. The Fugitive Dust Best Management Practices Plan and the Site Housekeeping Plan will be revised to include LCFs.
Odour	Potential odour from shredding of weathered treated wood (e.g., railway ties and utility poles)	Effects, if any, are expected to be localized during shredding operations. Processed LCFs will be stored under cover, and the Lafarge Bath Plant's Health and Safety Plan will be revised to include LCFs. Personnel involved in the shredding operations may be required to wear suitable air purifying respirators.
<b>Noise</b>		
Noise levels	Increased noise levels from low carbon processing and delivery systems	Measured and predicted sound levels from the facility, including LCF equipment, are below regulatory criteria during daytime/evening/nighttime hours.



# AIR MODELING



# VIDEOS



**HOW THE LAFARGE  
BATH PLANT MAKES CEMENT**

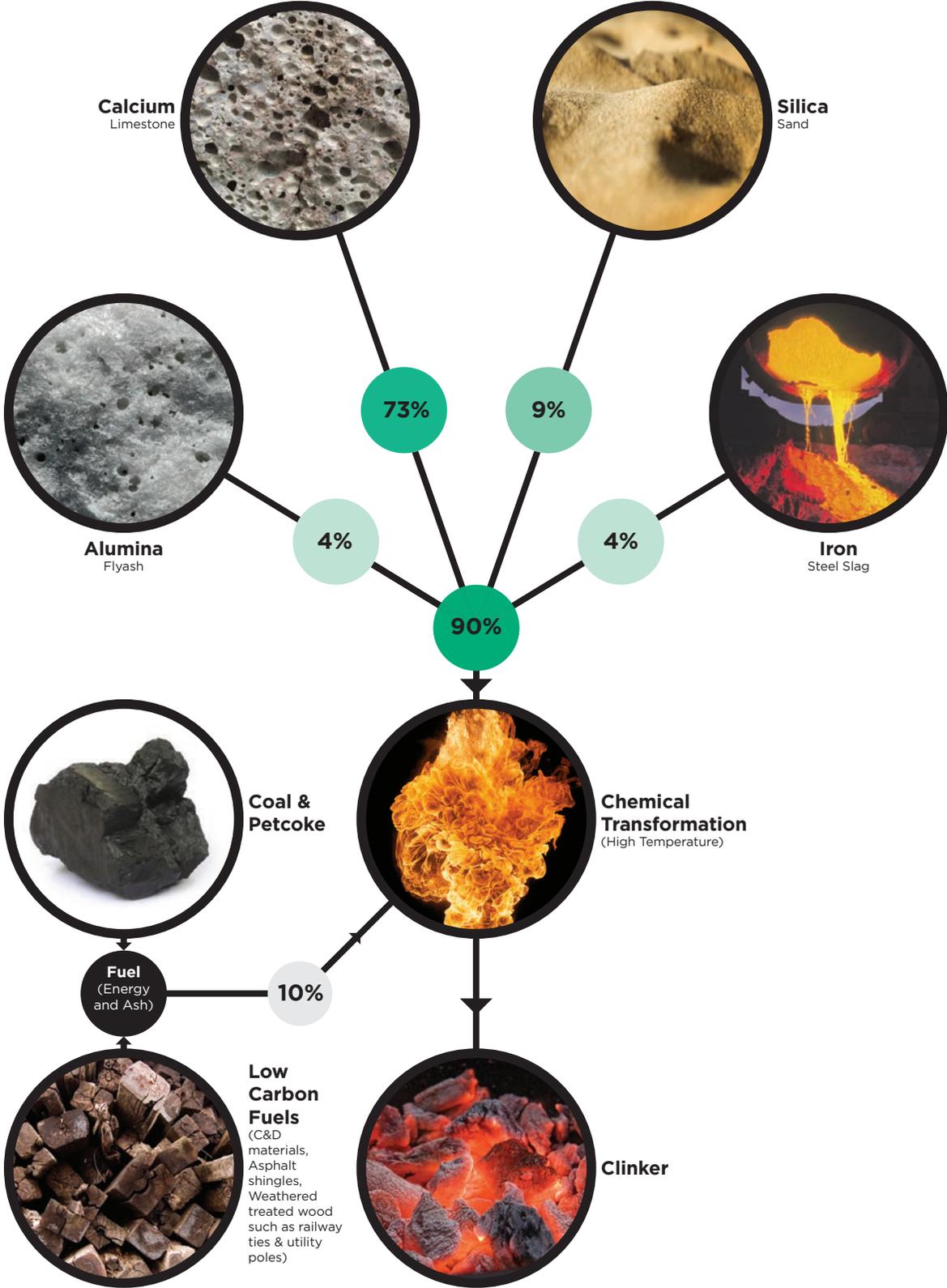


**LAFARGE CONSTRUCTION  
SOLUTIONS**



**WARREN MABEE PRESENTS  
THE QUEEN'S TEST RESULTS**

# HOW IS CEMENT MADE?



# WHAT IS WEATHERED TREATED WOOD?



## Railway ties, Utility Poles, and Other Treated Wood

- Over 24 million railway ties are replaced each year (or about 1.3 million tonnes) not including stockpiled ties
- Carbon savings of 85-90%
- Creosote is derived from coal and acts to improve fuel performance
- Railway companies stockpile ties during maintenance and deliver to processing or disposal sites by gondola cars
- Use of rail delivery reduces truck traffic

## Railway Ties Fuel Specifications

- Size - 90% passing a 10 mm screen
- Heating Value - >17 GJ/tne
- Moisture content - <15%
- Carbon savings - >85%
- Ash - <5%

# WHAT IS CONSTRUCTION AND DEMOLITION MATERIAL?



C&D is widely used to refer to any waste material that is generated from the construction and demolition of various types of civil infrastructure.

In November 2014, a bin of C&D material was provided by a local supplier. Queen's University Students completed an inventory of the contents; results are presented in the table below:

<b>Generalized Component</b>	<b>Categories included</b>	<b>Mass of generalized component (kg)</b>	<b>% Composition of generalized component</b>
Wood	Wood Waste Green Wood Waste (High Moisture Content)	776	31
Fuel Grade Wood	Painted/Stained Wood Treated Wood Mixed/ Non-separable Demolition Wood	591	23
Engineered Wood	Engineered wood composites	891	35
Miscellaneous	Other materials including sand, gravel and other aggregates	284	11

# WHAT ARE ASPHALT SHINGLES?



Did you know? There are 3-4 tonnes per roof and 10 million tonnes of shingles are landfilled per year in the US.

## Asphalt Shingles

- Shingles are removed by roofing contractors and taken to local waste management sites.
- According to US EPA studies, shingles have about half of the carbon emissions than coal on a life cycle basis.
- Roughly half of the shingles form “fines” that are removed by the processor
- Magnets are used to remove ferrous metals, eddy current magnets for non-ferrous metals

## Asphalt Shingle Fuel Specifications

- Size - 90% passing a 20 mm screen
- Heating Value - >19 GJ/tne
- Moisture content - <10%
- Carbon savings - >50%

# LCF: COMPARISON TO COAL

Parameter	Coal	Shingles	C & D	Ties
Density, kg/m <sup>3</sup>	640	552	239	249
Water, %	1.6	6.5	23	13
HHV, GJ/tne	26-30	23	14	19
Ash, %	13	28	10	3
C, %	80	45	35	48
H, %	6	5	4	6
N, %	1.4	0.5	0.1	0.1
O, %	n.d.	12	27	30
Cl, %	.08	.02	.06	.03
% < 10mm	100%	86.5%	99.9%	99.9%



# HOW TO BE INVOLVED

We value community input as an integral part of our success with this Project. Here is how you can get involved at each step:

**1. This Public Meeting**

- Ask questions and let us know what you think
- Complete the comment form
- Send us comments and questions by email or in writing (contact info below)
- Review draft technical reports available on the Cement 2020 website

**2. Draft Environmental Screening Report**

- Review the Draft Environmental Screening Report once posted ([www.ebr.gov.on.ca](http://www.ebr.gov.on.ca))

**3. Stay Informed on the Next Steps**

- Stay informed by visiting the Cement 2020 website ([www.cement2020.com](http://www.cement2020.com)), and reading the newsletter

For more information please write to:

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