

Systech Environmental

Systech, Wholly owned subsidiary of LafargeHolcim

LafargeHolcim is a global leader in cement, aggregates and concrete

- 2500 facilities, 115k employees , 90 countries
- US \$34.1b Net Sales, 386 m tons product

Systech provides AF (alternate fuels) to the LafargeHolcim cement plants

Common AF: Tires, C&D, Mfg. Scrap, Solvents & Biomass

Roofing shingle scrap as cement kiln fuel

Cement Manufacturing

Large & energy
intense operation

60% of Raw Material
(RM) is Limestone +
Iron, Silica & Alumina

RM is pulverized &
fed to rotating kiln

Heat “melts” RM &
chemically
recombines to form

clinker
Clinker is crushed &
mixed w/Gypsum to
make cement

Cement is to concrete
what flour is to a cake

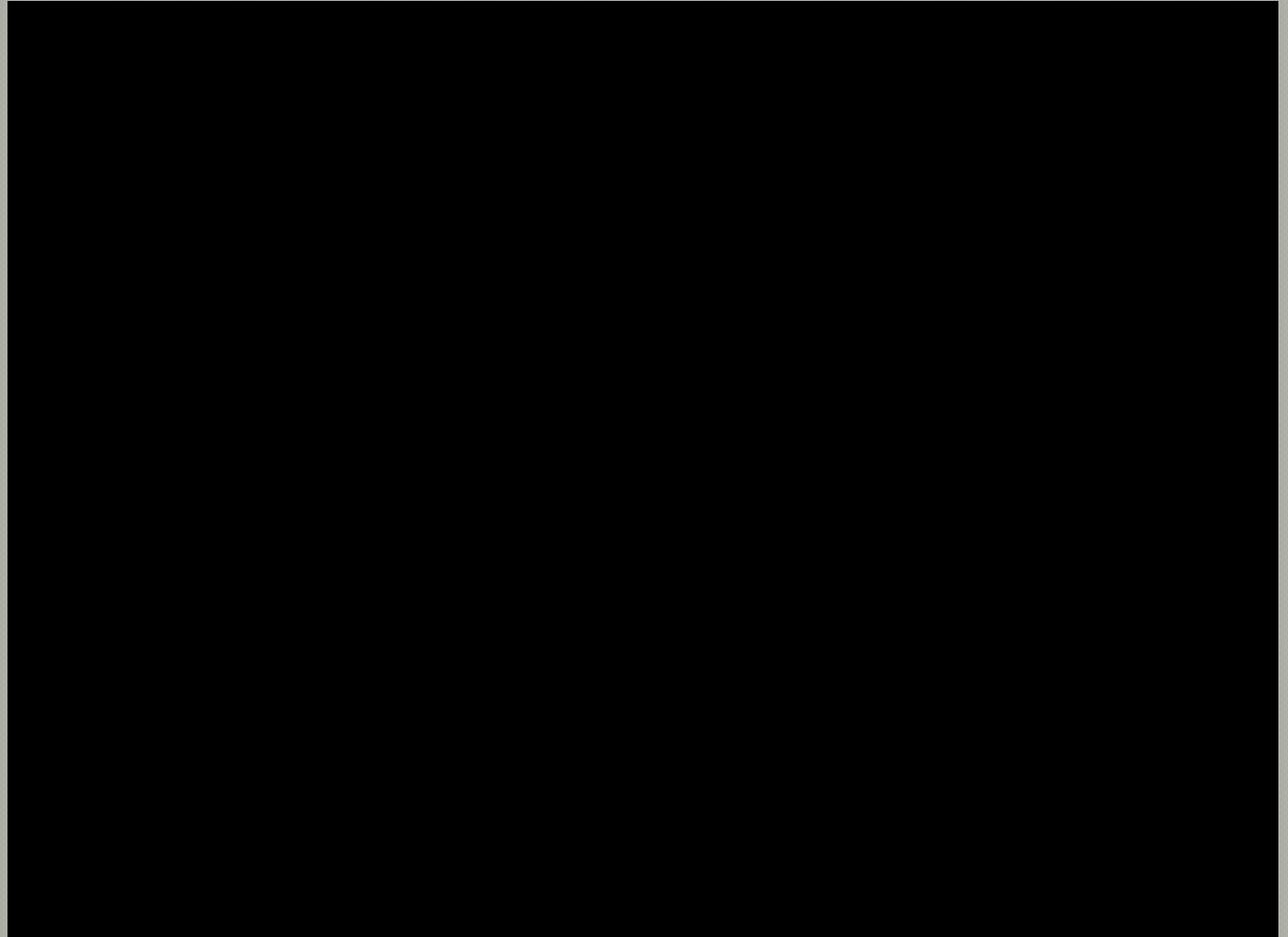


Shingle Flake: the Source

Shingle Flake almost exclusively residential
R/O, Contractor & crew arrive & prep

Tear-off Begins
Vents, caps, antenna, fixtures, wood, brick, packaging, boxes, plastic wrap, broken tools & ???

Everything goes in the bin



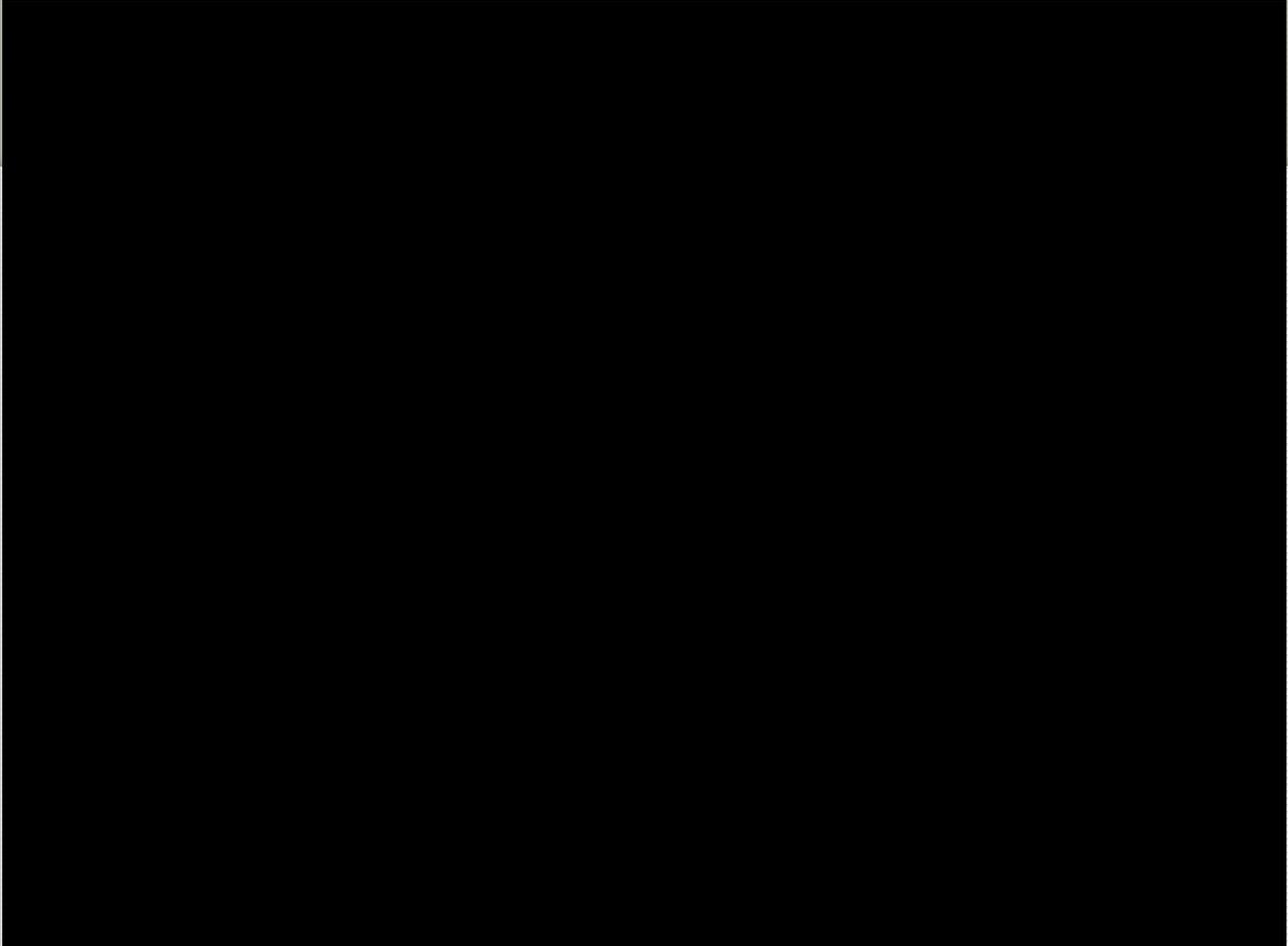
Delivery & Decontamination

Roll-Off Arrives

Emptied in
Receiving area

Manual Sort is
common

Recyclables
removed
Metal, aluminum,
wood,
Trash is discarded



MHA Process

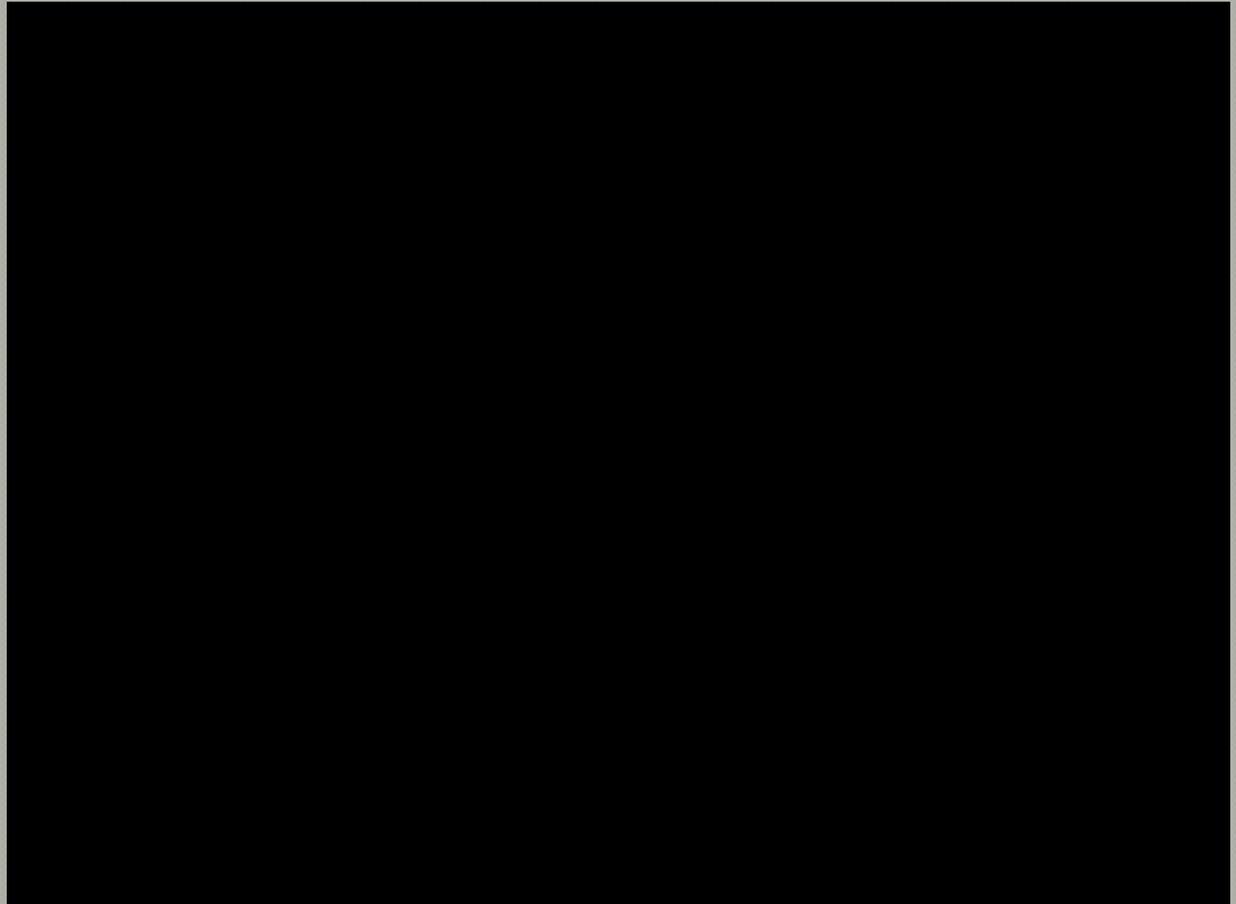
Custom built Shingle processing equip

Electric grinder

Horizontal Dual deck screening

X-belt & Head pulley
Magnets remove nails

Flake, Grit, & Over's
discharge separately



Shingle Cycle Process

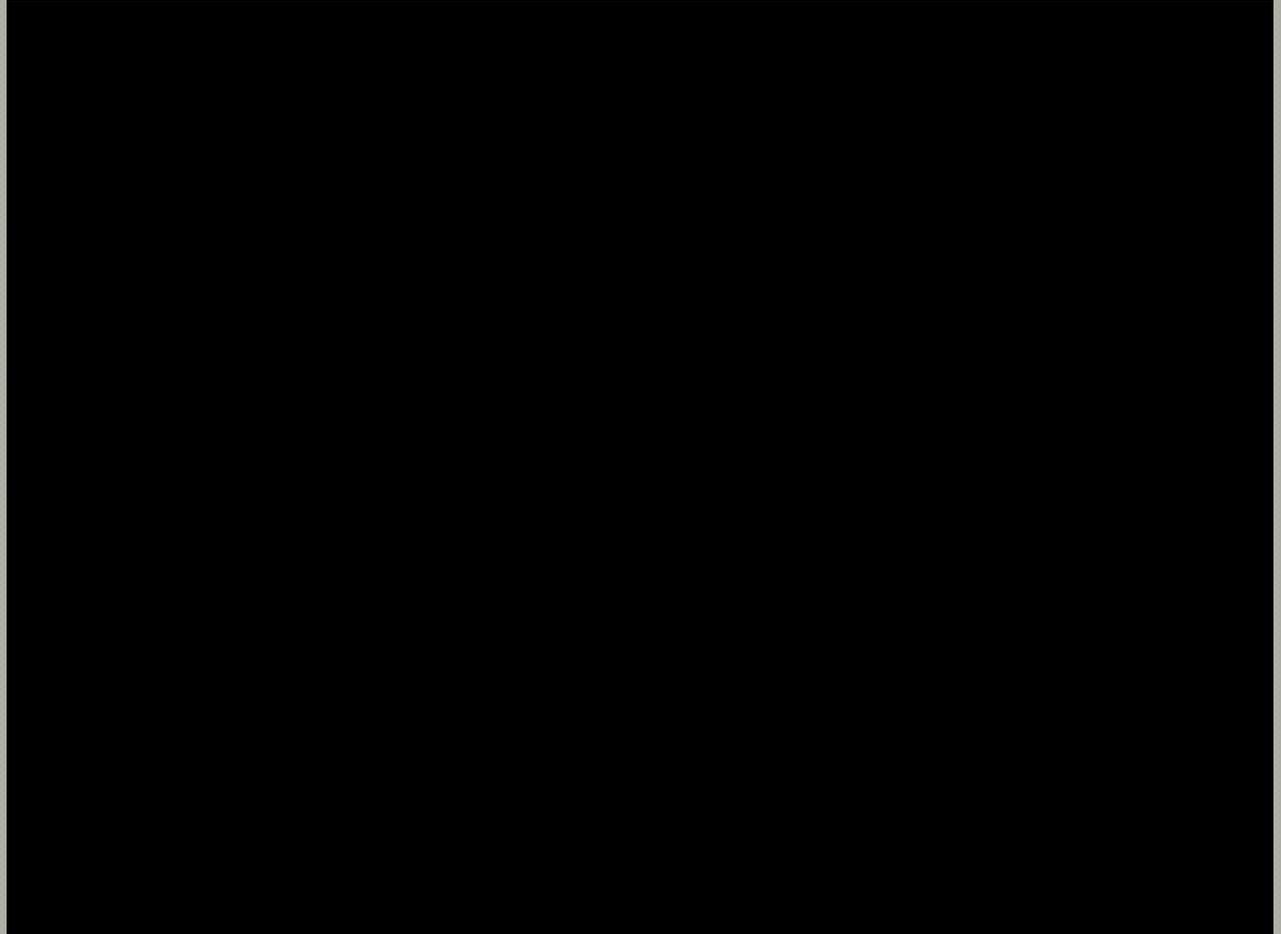
Started with a
Historic pile ~ 25k
Tons

Dozer “Scarifies” pile
& moves to Excavator

Processing &
separation w/custom
trommel screen

Flake, Grit, & Over's

DeCon Pic-Sta + X-
belt & Head pulley
Mags for quality



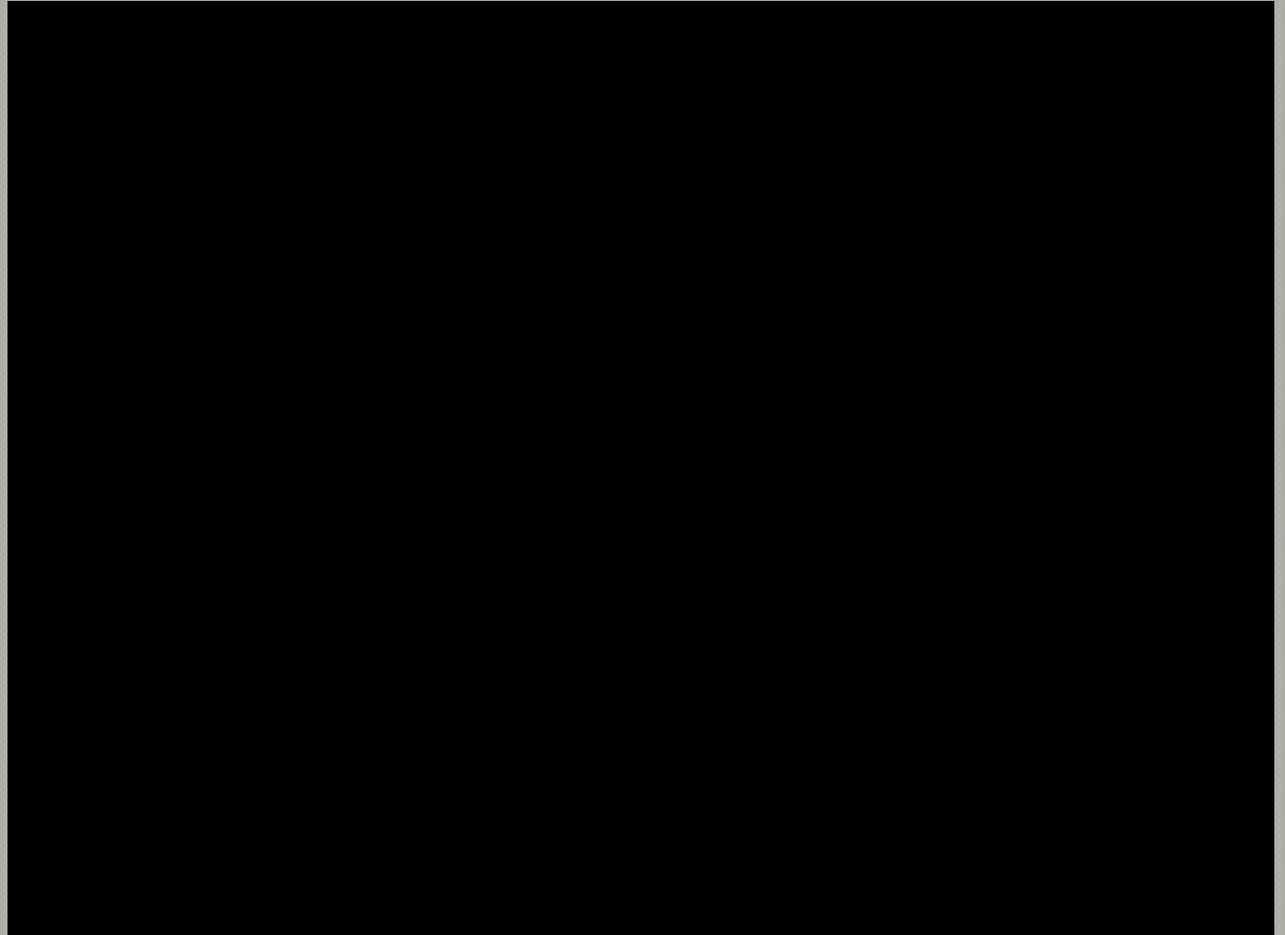
Final Product Delivery

Delivered via Multi-
axle Walking floor
Trailers

Self discharging &
Self Cleaning

Stored in same
fashion as other
fossil fuels

10,000 ton pile of
Flake Vs 120K tons
fossil fuel



Benefits & Economics

Why Make Shingle Flake ?

- Ø Added revenue source
- Ø alternative to HMA's
- Ø Less waste to landfill
- Ø Lower Maintenance cost
- Ø Can lower production cost
- Ø Some plants take mixed materials

Is it Economical

- 2012 – 2 sites making flake (BFD & STC)
- 2014- 4 more sites making flake (LAN, G.R. MSK, NY)
- 2016 – 2 more sites making flake (HAML, FLT)

What is the secret for success

IF “disp” > “Rev” (F+G+A+M) – (“proc” + del + ovhd+ Profit)

The real Economics

Jobs, Revenue, Environment

- Ø Estimate: USD \$.5 mil in wages
- Ø 1000 loads hauled
- Ø 12 full time positions (in MI)
- Ø Over 60k tons/yr diverted from landfill
(12mo)
- Ø > 32k tons/yr fossil fuel saved\