PepsiCo/Frito-Lay Sustainability

Energy in Food Manufacture

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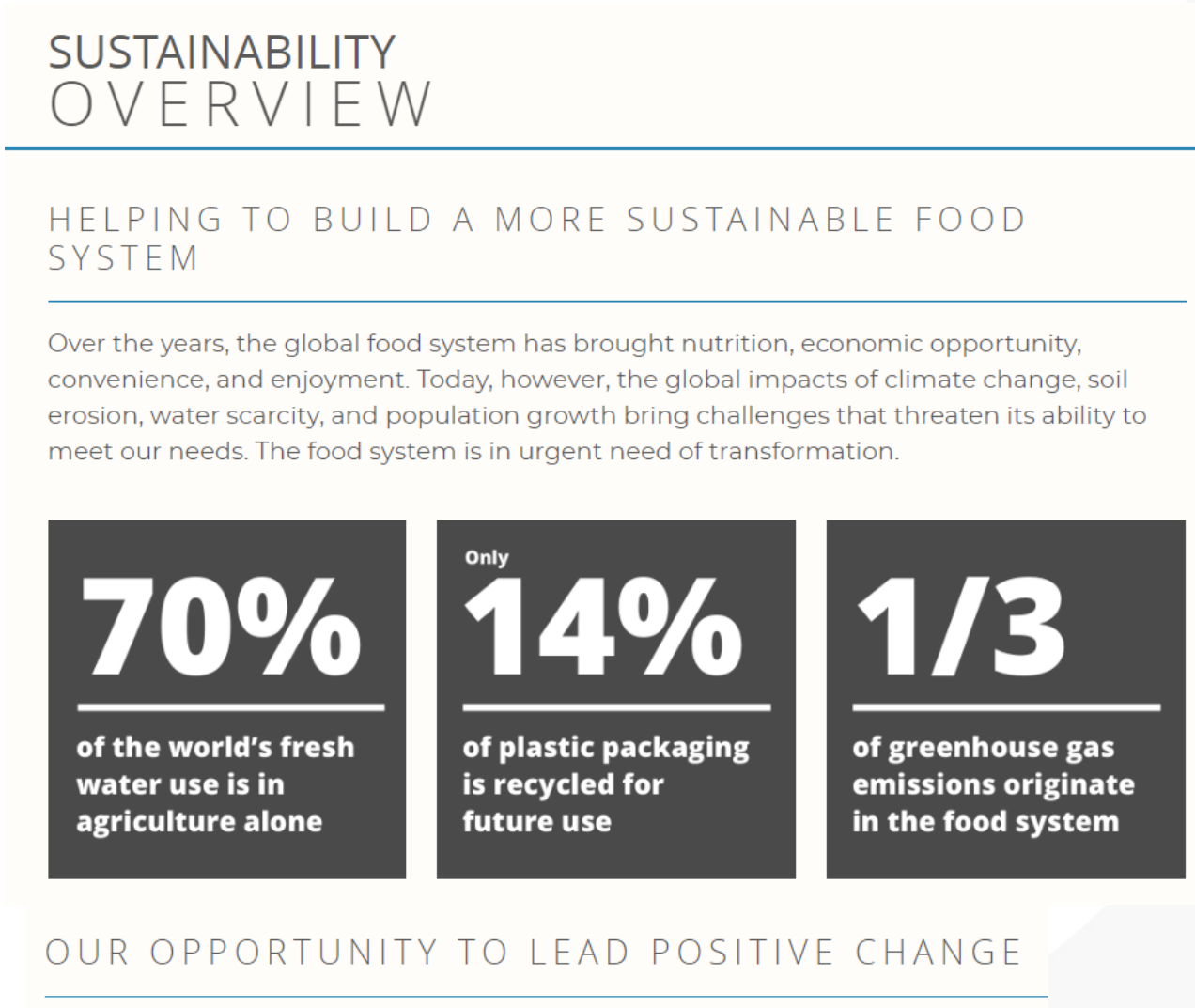
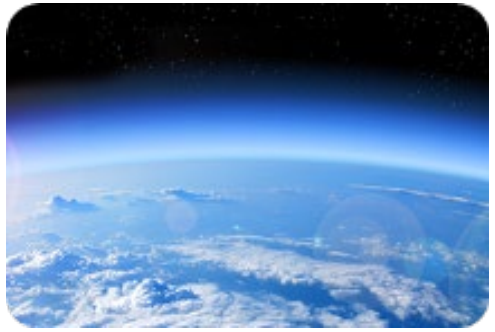
PepsiCo Sustainability Overview



Improving water and energy efficiency and finding cleaner sources of energy are critical to meeting our sustainability goals!

Energy, Water, & Waste Sustainability in Food Manufacturing



Energy Efficiency

Alternative sources – biomass, thermal vs electric, solar/renewables

GHG & Efficiency Profile of various energy sources
(e.g. compressed air vs electric)

Base cost to operate

Resiliency – grid outages

Water use efficiency
- Plant operation
- Processing and Packaging

Stewardship & Advocacy
- Adoption of AWS Standard

Replenishment of water used

Reduced waste = reduced energy & water

Zero Landfill

Recyclable materials

Reduce packaging

Base business practice

Success and Design Criteria of Solutions

Our Energy Priorities:

Cost to Operate
Energy Efficiency
Climate Impact
Resiliency/ Reliability

Snacks Scale: ~40 Plants in US+Canada
~200 production lines

Success and Design Criteria

TECHNOLOGY

- Retrofittable
- Scalable
- Must provide a positive ROI
- Maintainable
- Reliable
- Measurable/verifiable impact

PRACTICES/PROGRAMS/POLICY

- Executable
- Cost effective
- Clear connection to goals & results
- Consistent with values and overall strategy
- Inspirational

Consistent with product design, quality, capacity, and food safety imperatives

Meets all personnel safety and operational risk needs

Technology Development Process

Plant Personnel

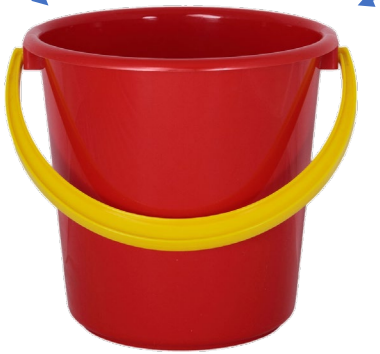
R&D

Suppliers

NGOs/Labs

Online

Industry



Ideas meeting go-forward criteria & priority

<u>Pilot test</u>

Usually Full Scale, single site

Evaluate/confirm performance, savings, reliability, etc.

1mo – 2 yrs

<u>Scale-up/replication</u>

sites depends on economics and impact on goals

Timing dependent on resourcing and priority

Operations Supply Chain Climate/Energy Approach

Base Efficiency

- Thermal Insulation
- Heat Recovery
- Practices: Optimized Operation, Best Practice Replication, Ownership
- Conventional Automation
- LED Lighting
- Waste Reduction
- Fleet: lightweighting, aerodynamics, driver training

~90% penetration

Technology

- Renewable Generation (solar)
- Biomass Boilers
- Advanced Lighting Controls
- Advanced Combustion Tech.
- Dashboarding and Analytics
- Fleet: Electric and CNG alternative fuels

~25-50% penetration

Emerging/Evolving Opportunities

- Predictive Performance Mgmt - AI/Machine Learning
- Industrial IoT
- Microgrids/Energy Resiliency
- Electrification of thermal loads
- "Campus" strategy vs individual tactics
- Further Renewable Fuels

~5-10% penetration

Obstacle/Need: Finding &/or developing technology that can help us on our climate journey while providing an acceptable return on investment. (Scope 1&2 GHG)

Main Opportunity on snacks is in thermal processing and waste heat capture.

Climate & Energy - Results

PEPSICO IS EMBRACING RENEWABLE ELECTRICITY AROUND THE WORLD:

USA

Transitioning to **100% renewable electricity** in U.S. direct operations in 2020.

EUROPE

Currently using **100% renewable electricity** in 9 European countries.

MEXICO

Sourced 65% of electricity needs from **wind energy** at PepsiCo Foods Mexico in 2019.

In early 2020, we signed the UN's

Business Ambition for 1.5°C pledge,

underscoring our commitment to science-based target setting.

Over the life of our Frito-Lay electric vehicle fleet, we will have

driven 12 million all-electric miles

PepsiCo

reduced absolute GHG emissions by 6%

across our value chain in 2019, progress toward our goal of 20% by 2030.