

A large, detailed illustration of a mammoth with long, curved tusks, standing in a field. The mammoth is the central focus of the image, with its head turned slightly to the left. The background shows a natural, outdoor setting with some vegetation and a path.

# The Zoo as an Engine of Sustainability

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Resource100 LTD

**“Recognizing its impact on all stakeholders, the Columbus Zoo and Aquarium will develop a world class sustainability program leading to the meaningful reduction of its carbon footprint.”**

**Columbus Zoo and Aquarium Board of Trustees, 2008**

# Guiding Sustainability Principles

In long-range planning and day-to-day operations, these 3 guiding principles will assure availability and sustainability of Columbus Zoo and Aquarium resources:

- Minimize Resource Degradation
  - Minimize Resource Depletion
  - Maximize Resource Efficiency

Do all of the above with an integrated systems approach to problem solving and decision-making

# Pathway to Sustainability

Recognizing that sustainability is a journey rather than an endpoint the Zoo is on a path to provide for the orderly transition to a “culture of sustainability”

Several projects and initiatives will be developed over the next few years.....they will “learn and get better by doing the right things in the right way”

- providing cost-effective advanced energy
- maximizing waste reduction and recycling
- improving water management
- developing a local reliable food supply for zoo animals
- utilizing “green building” technologies



- The Zoo staff understands complex global issues such as climate change
- The Zoo projects close to 2 million visitors this year
- The Zoo is a major destination for families to learn about conservation and sustainable business practices
- This in part is the thinking that went on in the planning and development of Polar Frontier

# Columbus Zoo and Aquarium Polar Frontier

“.....acquainting,  
teaching, and  
informing zoo visitors  
of the effects of  
global warming upon  
the Arctic  
environment”

Terri Kepes, Associate Zoo Director and  
Director of Planning



# Columbus Zoo and Aquarium Polar Frontier

“...the messages will be throughout the exhibit and available to visitors online long after they have left the Zoo”

Barbara Revard, Director of Program Development and Sustainability



# Columbus Zoo and Aquarium Polar Frontier

“...major decisions regarding the design, construction and operation of Polar Frontier have been made that will reinforce the messages”

Dave Etzkorn, Associate Zoo Director and Director of Facilities

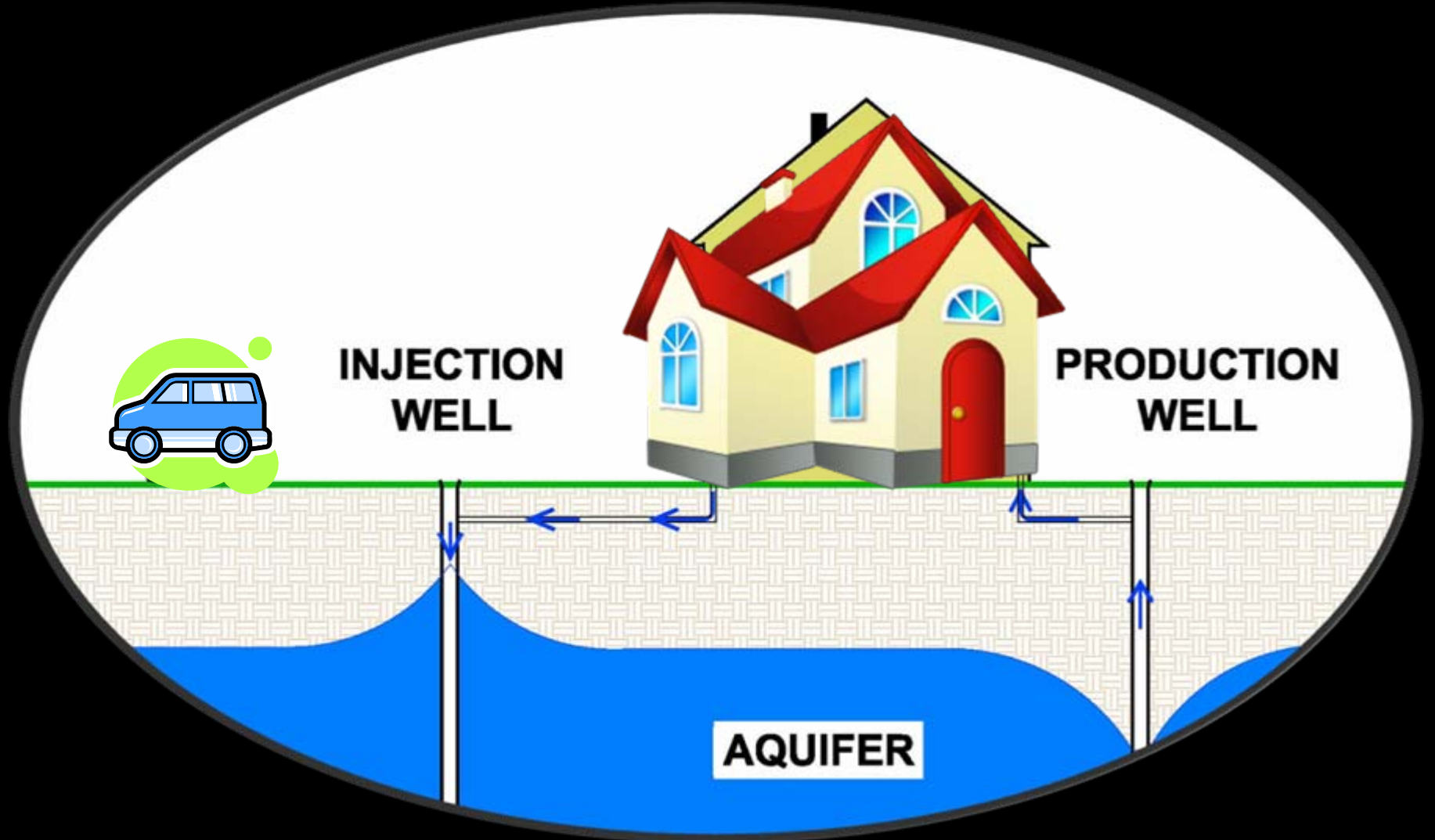


# Integrated Water Treatment/Polar Frontier Geothermal System

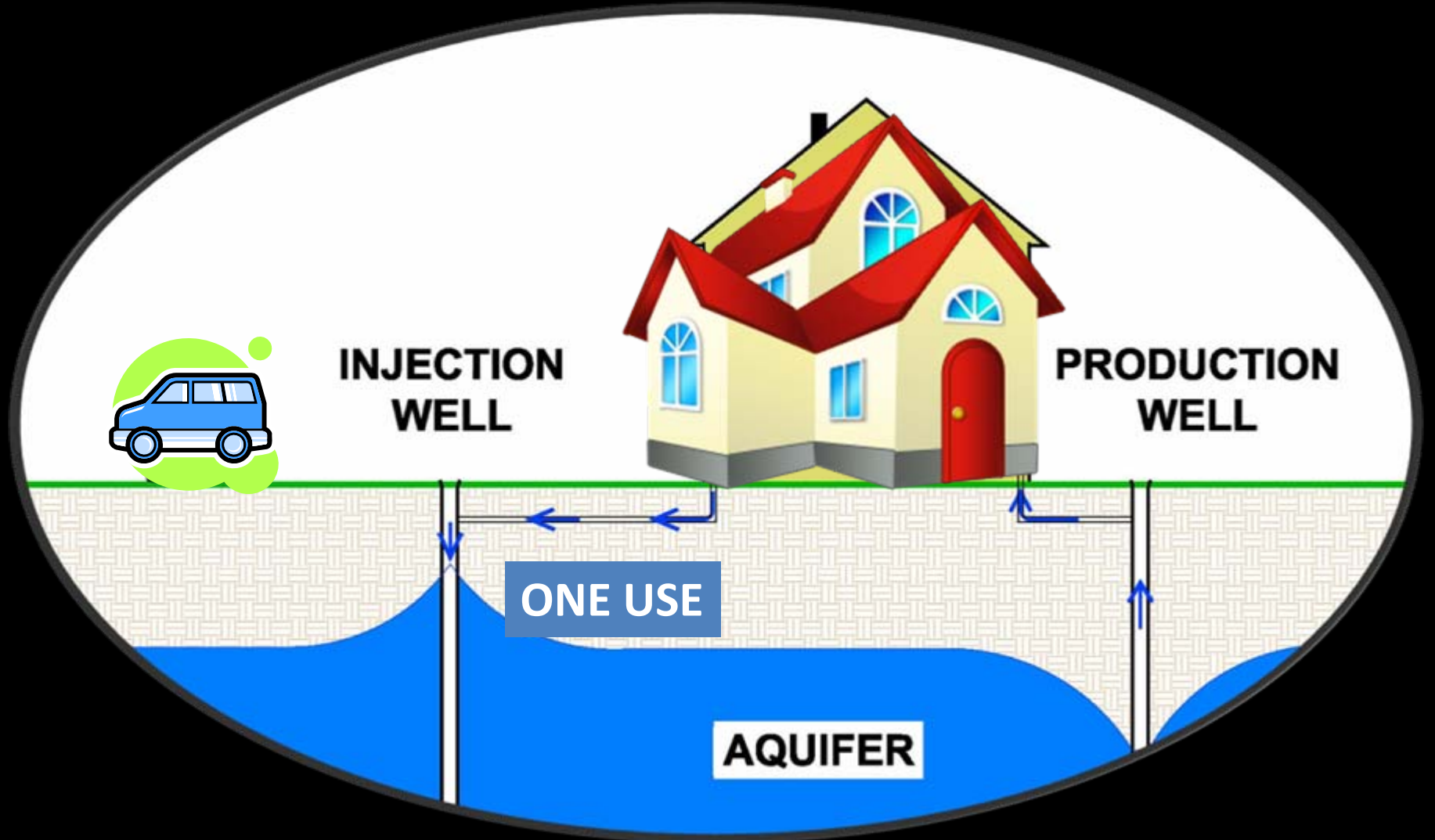
"A systems thinking approach to Sustainability"

- Zoo building new Polar Frontier Exhibit (\$20 million)
- Zoo needed new water treatment plant (\$4 million)
- Traditional approach was to view as independent projects
- Geothermal initially considered for Polar Frontier but discarded as “too expensive” costing \$2.5 million more of unavailable capital funds
- With developing “culture of sustainable thinking”, Zoo analyzed commonalities between water plant & geothermal ----- WATER WELLS

# Typical Open Loop Geothermal System

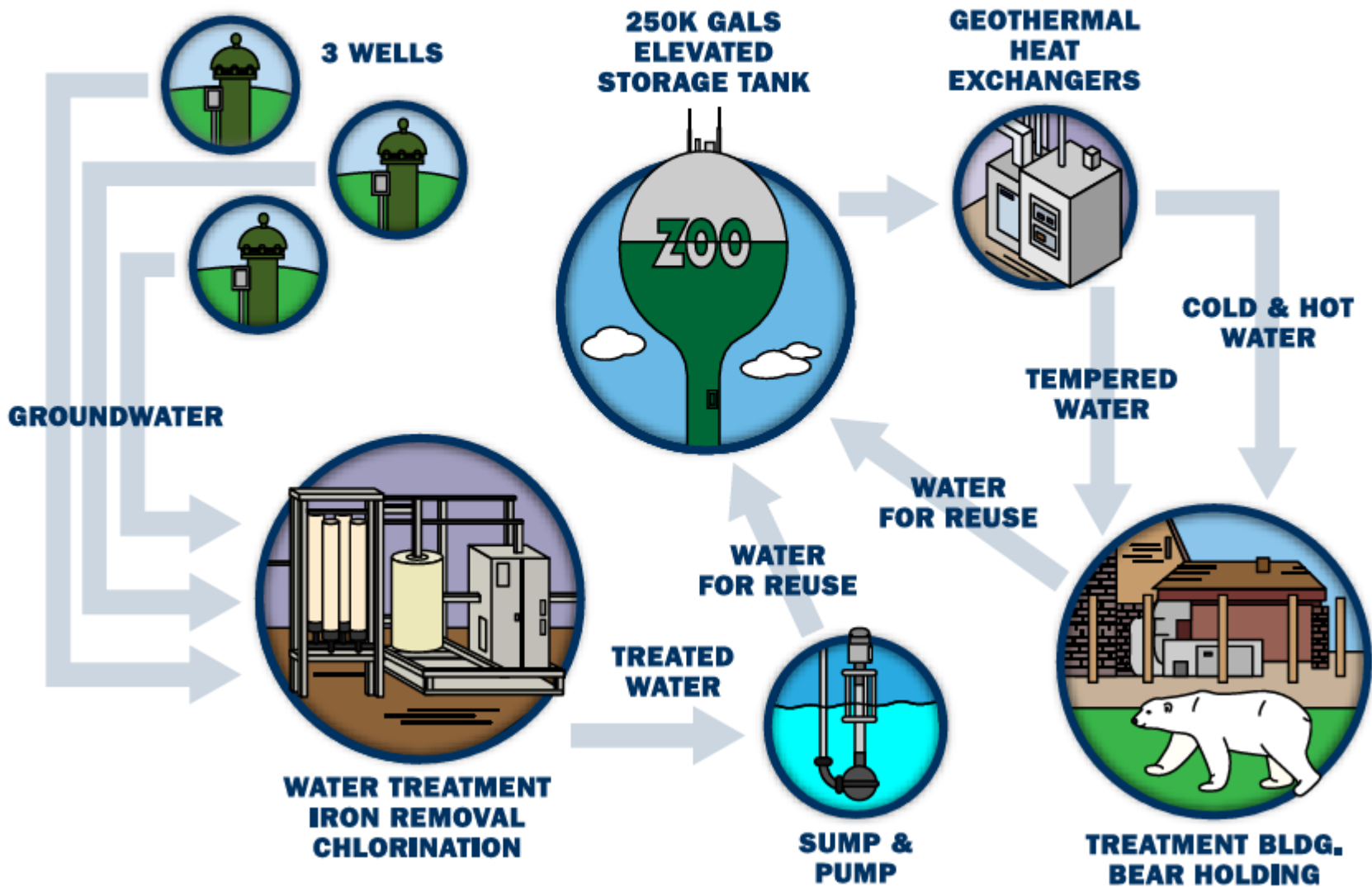


# Typical Open Loop Geothermal System



- 3 Wells – rated at 1 million gpd (double existing)
- New water treatment plant with iron removal and chlorination
- Geothermal heating and cooling to Fresh and Saltwater Life Support System buildings, water treatment plant, bear holding area and Conservation/Education building.
- Capital cost \$2 million less than if projects would have been constructed independently
- Complete recycle of water..... a “twofer”
- ROI on geothermal system is less than 6 years; even less to the extent that carbon offsets can be monetized

# INTEGRATED WATER TREATMENT / POLAR FRONTIER GEOTHERMAL SYSTEM



# So, why is this happening at the Columbus Zoo and Aquarium?



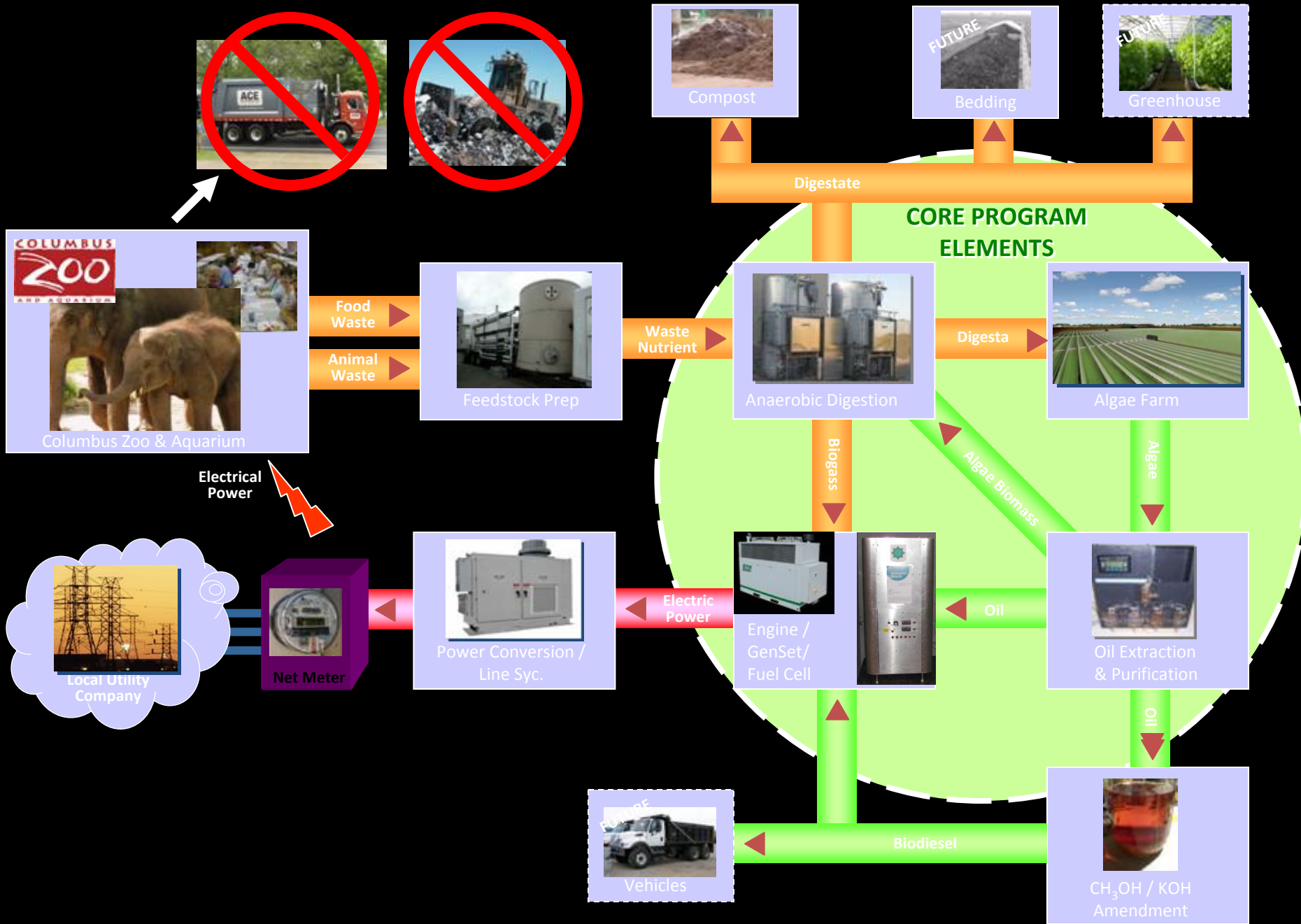
The Columbus Zoo is a global conservation organization

In 2008 alone, through direct action and more than 1.8 million direct dollars, we supported more than 70 wildlife conservation projects in 30 countries

As one example.....The Zoo's "Partners in Conservation" program works directly with Rwandan and Congolese people to support both wildlife conservation and humanitarian projects.



# Waste to Energy System Overview



# “Sustainability” Defined:

The Columbus Zoo and Aquarium