

May 2019



Problem : \$500B spent moving 2 billion tons of waste globally but <20% used

GLOBAL RECYCLING RATES



Our results in India since Nov 2015 :



by feeding source-separated waste to processing plants that can use that stream

Key ingredients for our success :



Source-controlled feedstock

Identifying waste-to-resource potential for each producer and ensuring compliance with our source separation standards to have a reliable supply chain for each processing plant



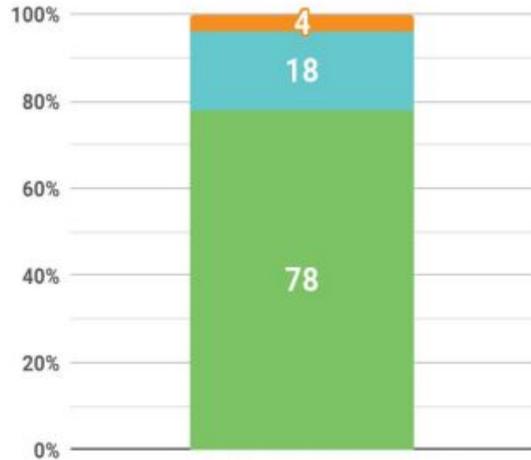
Efficient processing technology by stream

Highest conversion efficiency with “best use” of each feedstock to minimize climate impact and provide the highest ROI for asset owners, including sale of all plant outputs

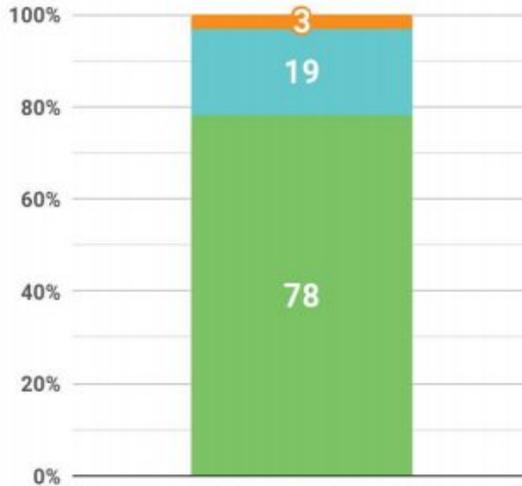
Customer Case Study : identifying reuse potential in waste at each location

WASTE COMPOSITION

HSR LAYOUT



IBLUR



WHITEFIELD

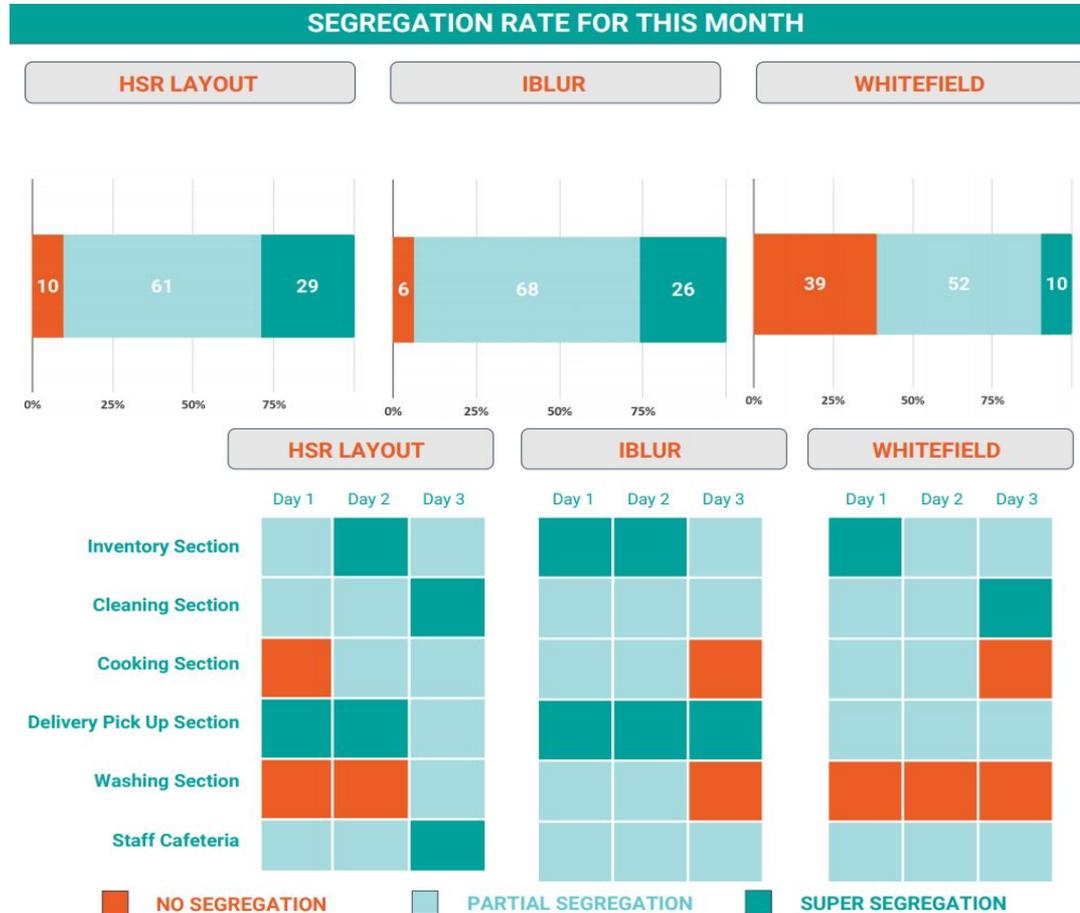


WET WASTE

DRY WASTE

REJECT WASTE

Customer Case Study : providing actionable feedback for behavior change

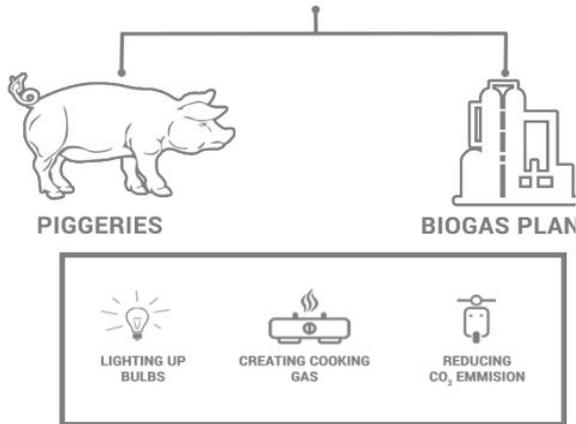


Customer Case Study : tracking waste conversion and recycling impact

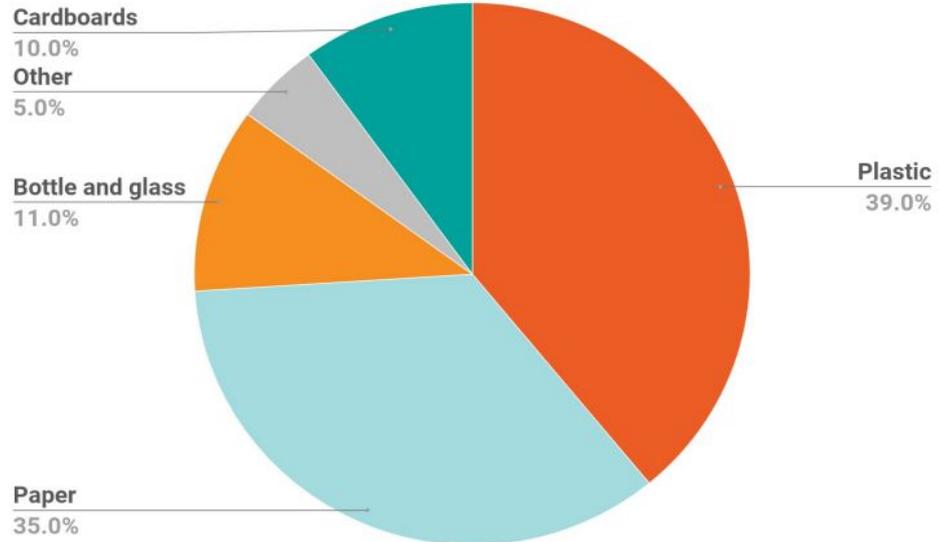
WASTE TO RESOURCE PROFILE

WHAT YOUR ORGANIC WASTE IS PRODUCING

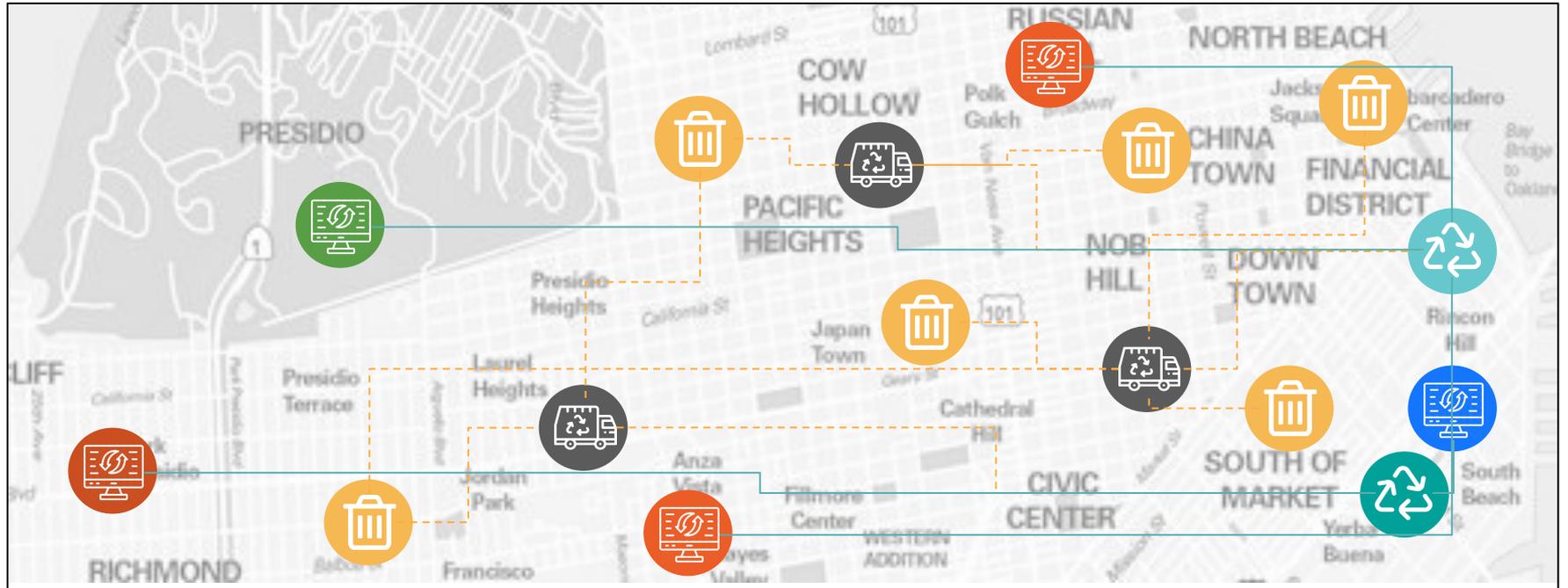
51535 Kgs



DRY WASTE COLLECTION



Solution : a platform to use waste locally with quality data+efficient technology



WASTE PRODUCERS



ANAEROBIC DIGESTION



RNG BUYER



ELECTRICITY BUYER



WASTE HAULERS



BIOMASS CONVERSION

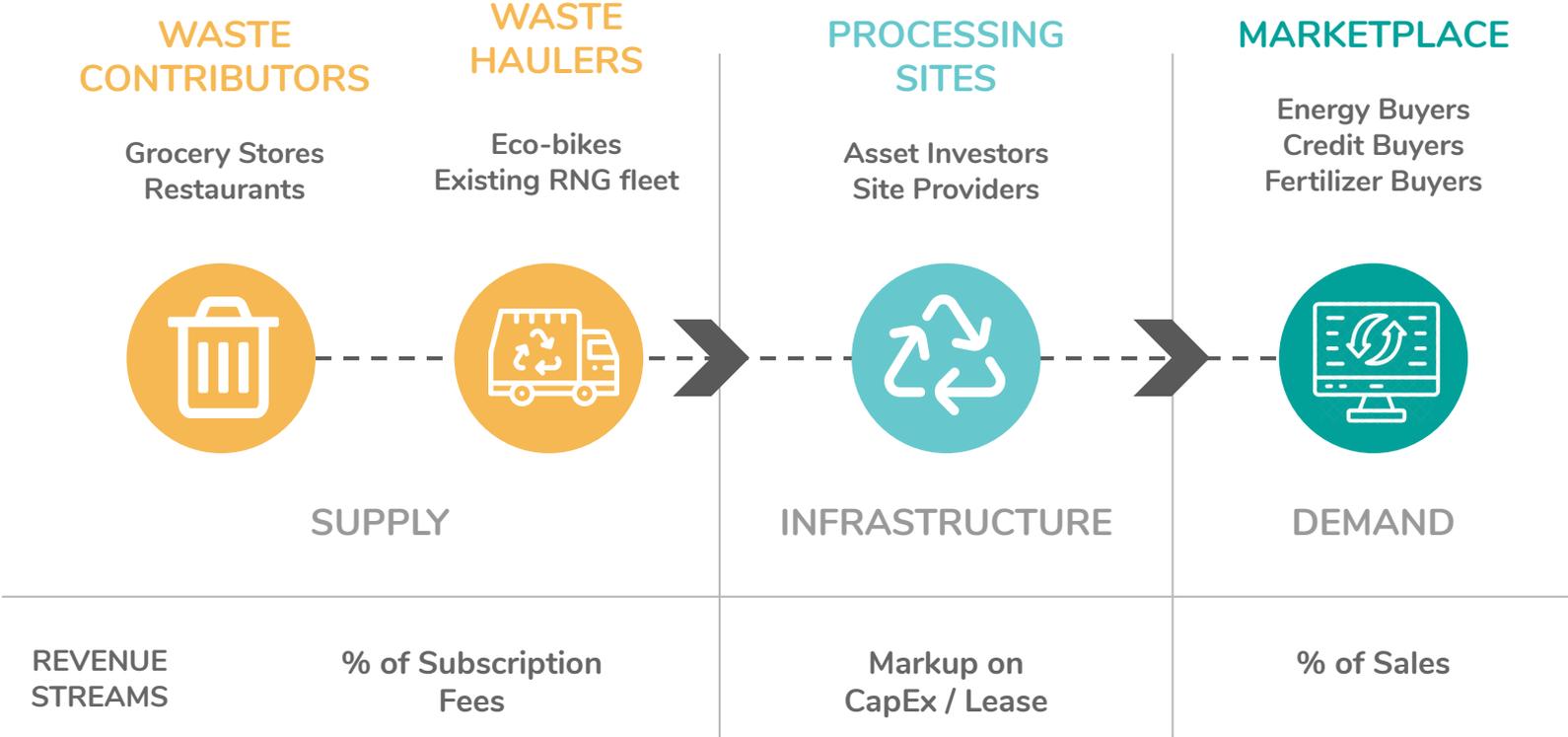


H2 BUYER



FERTILIZER BUYER

Business Model



Entry into the US Market

July 2018

First meeting with DPW, LA County to present India results and understand local opportunities

Aug 2018

DPW organized con-call with GO-Biz, Cal Recycle, and LAEDC to brainstorm how to enter the CA market, opportunities, incentives, grants, tax credit and loan programs we can utilize

Apr 2019

Task Force launched to assist in answering key questions around CA market expansion
Potential site for first AD and biomass conversion installation identified in LA County
Second meeting with DPW : 3-year estimate for permitting

May 2019

Meeting with GO-Biz and Cal Recycle in Sacramento : 60-day permitting option through LEAs
City of San Francisco wants tech solution to track source compliance with existing collectors
CA Districts+Counties with opportunities in waste, energy, agriculture exploring installations

Team

PRONITA SAXENA

Founder & CEO

Serial entrepreneur in cleantech, manufacturing, water, former DC-based policy wonk, studied Economics at UC Berkeley, researcher for MIT's J-PAL

ASHISH MALAYIL

Co-Founder, Network Operations

Merchant Mariner specialized in engine room operations for oil tankers, set up first cut-and-bend steel plant in South India, grew operations at water startup

FOUNDERS

MELANIE NUTTER

Business Development

Served as Director, Dept of Environment for City of San Francisco under current CA governor, District Director for Nancy Pelosi

DR. JOHN COATES

Conversion Technologies

UC Berkeley Professor of Microbiology, Chair Plant & Microbial Biology, and Academic Director, Energy Biosciences Institute

ADVISORS

DELHIVERY

Founding team of India's largest logistics startup valued at over \$1 Billion

PRASHANT MALIK

Co-creator of Apache Cassandra, early team at Facebook

CROWN PRINCE OF RAK

Largest investor in seed round, Leader of Ras al-Khaimah, one of the Emirates

INVESTORS

Value Proposition

PROCESSING ASSET OWNERS



Real Estate Developers
Existing Waste Processors
Energy Companies

DISTRIBUTION OF \$2MM CAPEX FOR ANAEROBIC DIGESTION IN CA



ANNUAL REVENUE COMPOSITION FOR A 10-TPD ANAEROBIC DIGESTER



WASTE PRODUCERS



Grocery Stores
Restaurants

PROPORTION OF WASTE SUITABLE FOR LANDFILL DIVERSION



Contamination fines to increase cost of landfilling by **50-100%** starting **July 1, 2019** in San Francisco with up to **25% discount** for landfill diversion and **SB 1383** will further increase cost of landfilling and source compliance

Social + Environmental Impact, first 6 years per 10-ton AD installation

20K
Tons of
CO₂e
abated

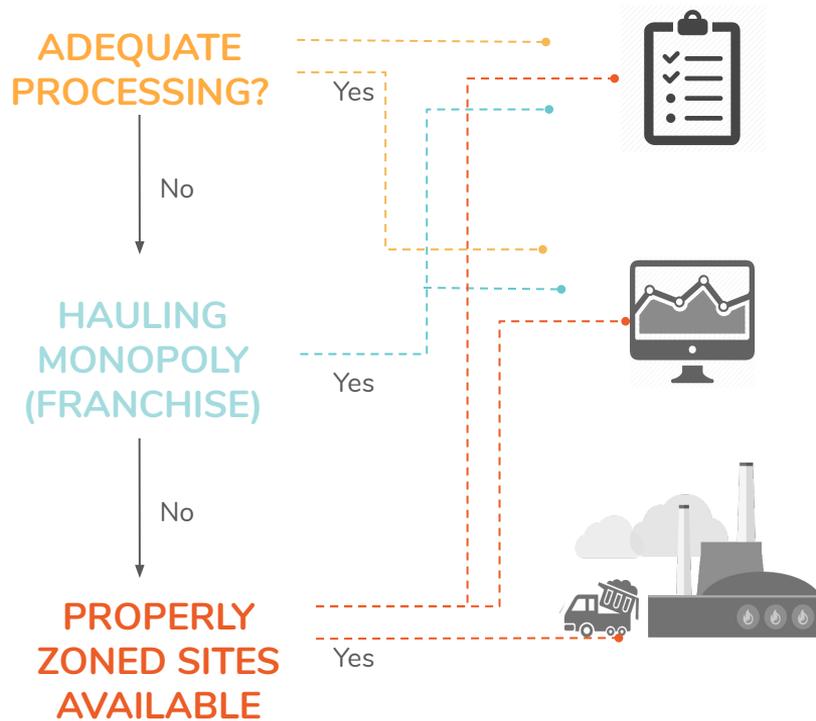
20-30
Green jobs
created

22K
Tons of
food waste
used

20K
MMBtu of
RNG from
food waste

40K
Miles not
driven to
dumps

Product Offerings



Data + Planning

Identifying waste-to-resource potential in specific neighborhoods and mapping to existing vs. required processing capacity

Tech + Training

Creating feedstock compliance from source through processing by working with existing haulers and processing sites to optimize conversion efficiency and waste utilization

Installation + Operations

Customizing, installing, and operating a grid of decentralized assets that use source-separated waste and monetize each output to create a model for circular waste utilization

Value Proposition for LA County



Potential vs. available capacity for anaerobic digestion in LA County = **11.5%**

Circular's platform helps **improve source compliance** through our **data generation & feedback tools** while increasing **decentralized infrastructure** to **use waste streams close to production and output consumption**.

For each installation, we **lease or finance the infrastructure**, engage **waste producers and haulers in the neighborhood** to supply source-separated waste, and sell the **energy, fertilizer, recycled products and carbon credits** produced to the respective markets.

May 2019

TECHNOLOGY PRODUCT DEEP DIVE



Improving waste usability at each location

@Door Services



Push/Pull

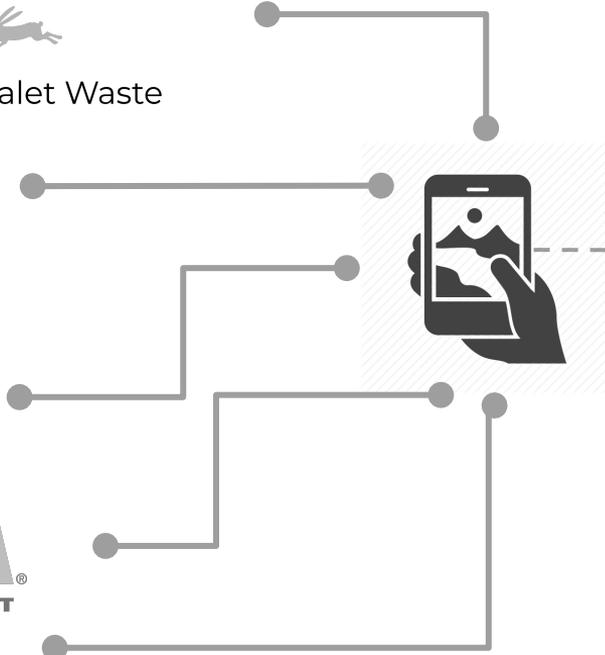


Auditors

Haulers



City Officials



PROCESSING



FEEDBACK

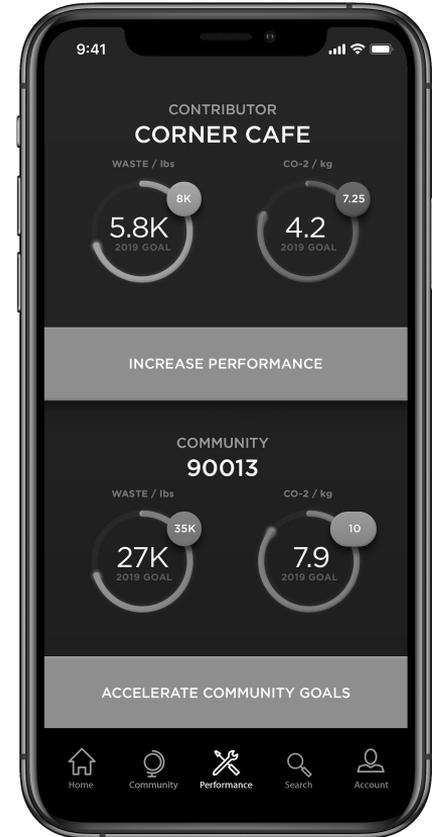


REPORTS



BILLING

Product Experience

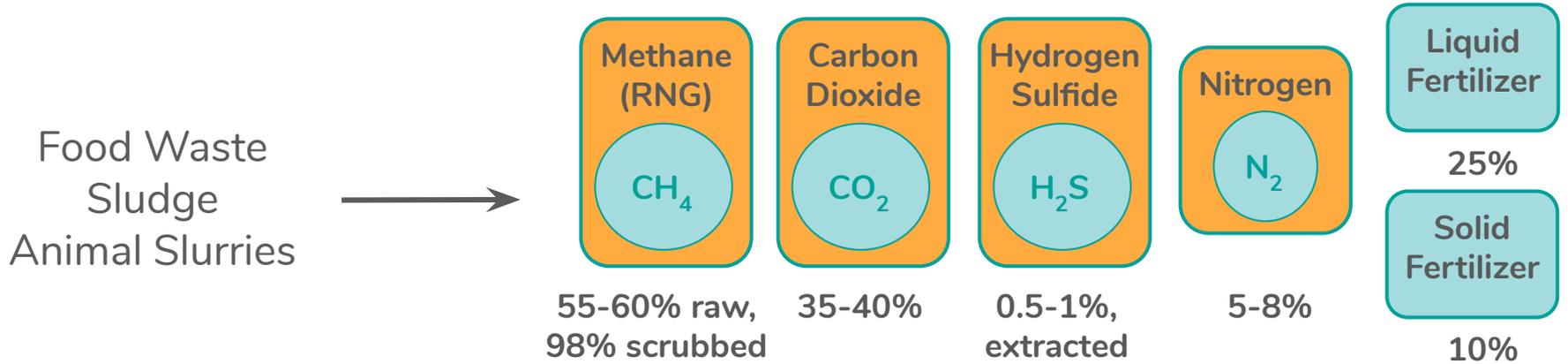


May 2019

PROCESSING TECHNOLOGY DEEP DIVE



Technologies : Anaerobic Digestion for food waste

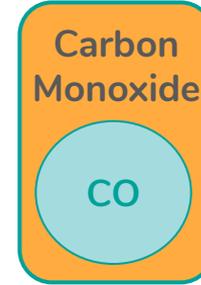
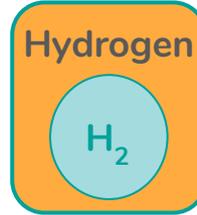


Technologies : Biomass Conversion for yard + agricultural waste

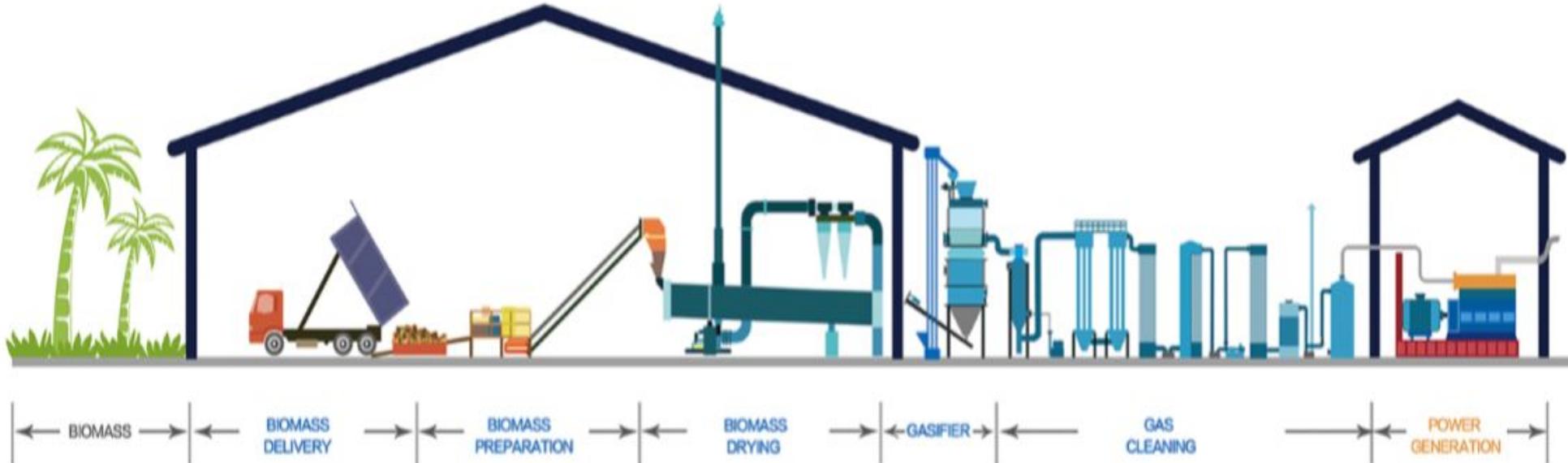
Yard Waste
Wood Chips
Agricultural Waste



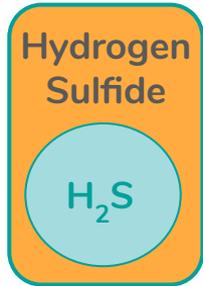
+ Heat
+ Oxygen



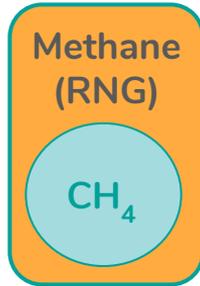
Bio-Char



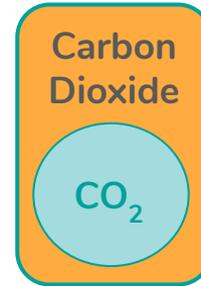
Monetizable Outputs



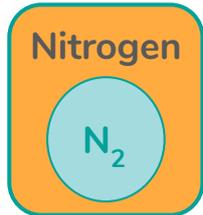
\$7 to \$10
per kg



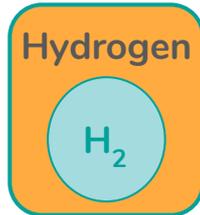
\$50 per MMbtu,
with credits



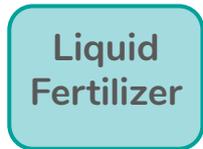
\$1 per kg



\$0.03 to \$0.07
per cum



\$13 to \$16
per kg



\$0.5 to \$0.7
per liter



\$1 to \$3
per kg



\$0.6 to \$1.8
per kg

60-day permitting process with CalRecycle & GO-Biz through LEAs

Zoning

Installation sites should have eligible zoning to avoid dealing with CEQA

Planning department, County Supervisors, City Councils

In-Vessel Conversion up to 100 TPD

Detailed requirements provided by state agencies regarding type of qualifying technologies

CalRecycle, CalEPA

Franchise

Not applicable for on-site installations that only consume waste streams from the site. For hub-and-spoke models, existing waste haulers/processors need to be engaged to avoid conflict with Franchise contracts and fulfill any capacity obligations

City Ordinances, Local haulers, processors, and agencies governing waste management

LEAs

Working with local air and water districts, fire departments and others for local permitting

Air District, Water Boards, Fire Department, City Councils

Site Stakeholders providing equity capital for state/federal loans+credits



Ancillary Services integrating waste+energy

We offer real estate developers & facility management companies an opportunity to earn more from their tenants in multi-tenant buildings that together produce a considerable amount of waste and incur high disposal and landfilling costs.



Profitable Models to transition from Landfilling

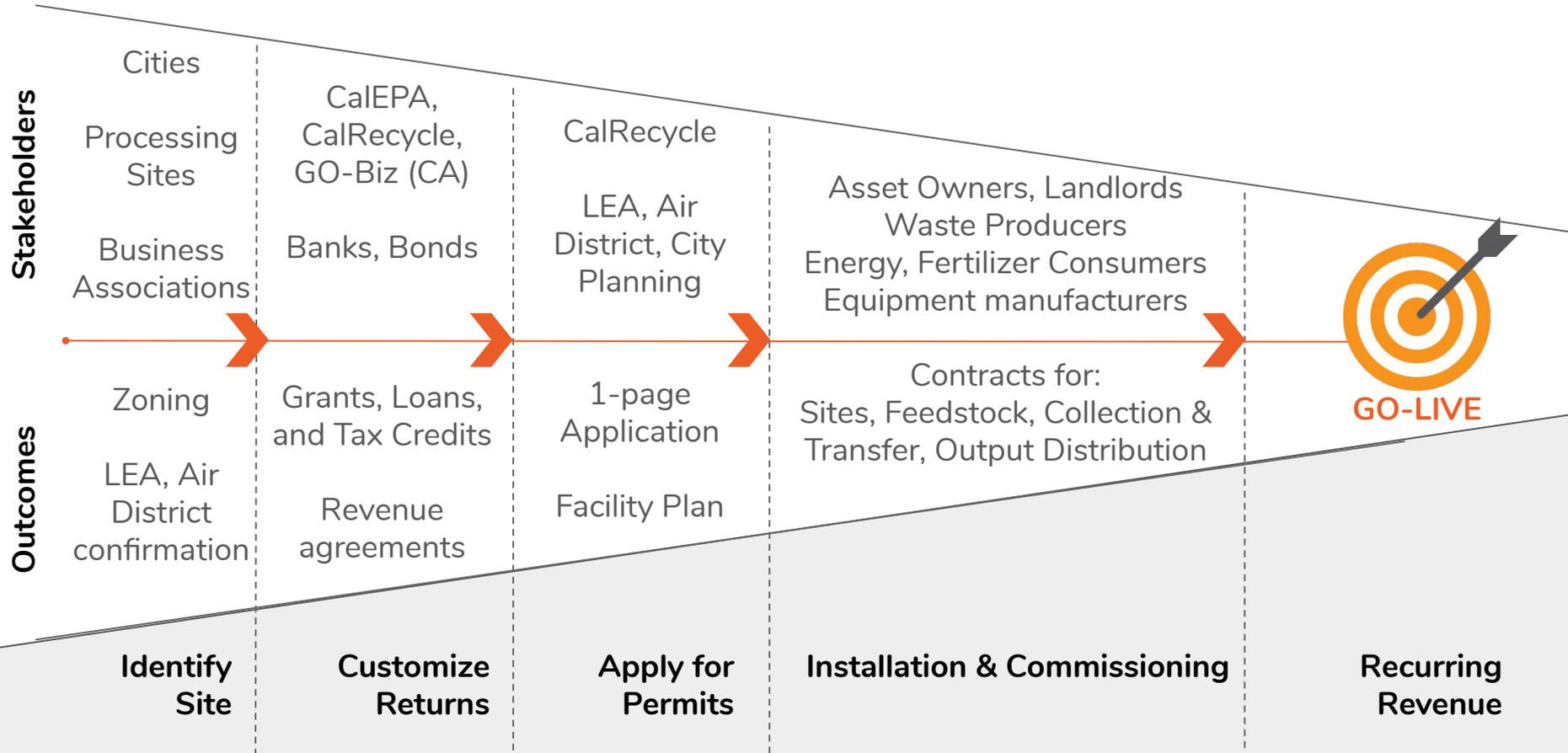
We offer existing waste management companies profitable alternatives to landfilling, a necessary adaptation in CA from 2022 onwards with SB 1343.



“Greening” energy companies + fleet operators

Utilities, large-scale biofuel buyers, and EV charging stations interested in owning renewable fuel infrastructure can partner with us to share asset ownership or buy bulk, long-term supply.

Site Enablement Process in CA



Next Steps

Existing Processes and Partners

- Current regulations, upcoming changes
- Local processing capacity
- Problems with compliance, feedstock
- Output markets

Collaboration

- Pilots vs. larger implementation of data, tech, or installation and customization products
- Data gathering and planning for future compliance and maximizing waste utilization
- Budgeting support for first few pilots, MVP launch

Pronita Saxena
pronita@citizengage.co
657-348-9705