Upland Road

Transforming Tomorrow, Today

SMART™ Sustainable Materials Management

February 2023

Upland Road mission

Upland Road resolves environmental challenges at scale.

Upland Road takes a systems-wide approach to re-conceive and modernize waste-handling infrastructure, creating jobs and benefiting communities by turning discarded materials into a source of sustainable economic growth.

Company overview

- Upland Road's patented, technology-driven waste management system, the MaxDiverter™, combined with selected off-take partners located at a SMART (Sustainable Materials and Advanced Recovery Technology) Center™ will allow recovery and reuse of ~90% of solid waste, reduce costs for municipalities and generate significant economic returns.

- Our principals have decades of executive-level experience shaping critical environmental decisions in multiple industry sectors around the world.

- The $250-300 billion U.S. waste management industry is ripe for disruption – both incumbents and new industry entrants are working to modernize the infrastructure. The significant financial and environmental incentives to capture value from the ~75% of waste that is currently incinerated or landfilled will drive the change that the market now demands.

- Building with a future-focused approach, Upland Road partners with universities and communities to ensure continued advanced-materials science research together with workforce training and skills development.

- Globally, Upland Road's approach will be transformative in countries where waste is a significant challenge, technologies are outmoded or nonexistent, and landfill space is limited.

Photo:STADLER

Overview

01

THE WASTE CHALLENGE

Current programs to address the growing volumes and complexity of the waste stream are incremental, not system-wide. Many focus on changing consumer behavior.

Demand for recycled materials is unmet and growing.

Neither today's infrastructure nor the consumer can separate and process waste ***at scale*** and with the accuracy needed to return valuable resources to the product stream.

02

SMART CENTERS™ ARE THE FUTURE

SMART (Sustainable Materials and Advanced Recovery Technology) Centers™ are the best solution to unlock the full value of the discarded material stream.

SMART Centers™ use a patented system based on proven commercial technologies to process up to 90% of discarded materials into valuable feedstocks and finished products. Each SMART Center™ processes ~2,000 tons per day, putting waste that is currently being landfilled or incinerated back into the economy at its best and highest use.

03

SMART BENEFITS

Proven SMART Center™ technologies and patented processes will achieve recycling and reuse goals while supporting the creation of a true circular economy.

An environmental burden to local governments will become an economic engine, spurring business growth and creating jobs.

Restructuring the systems and methods by which solid waste is collected and handled will benefit local communities and greatly reduce greenhouse gas emissions.

04

TEAM AND PARTNERS

Upland Road's principals have deep and broad executive-level experience in environmental- and sustainability-related fields across multiple industry sectors.

Upland Road's is partnering with industry-leading firms to build SMART Centers™ and ensure robust performance.

01

The Waste Challenge

The waste challenge

Achieving full materials re-use requires us to address the *entire* waste stream, rather than individual segments of it.

Current recycling and waste management systems are structurally incapable of achieving needed environmental and economic performance.

>450

million tons of waste generated annually in the US

<20

years disposal capacity remaining in the US

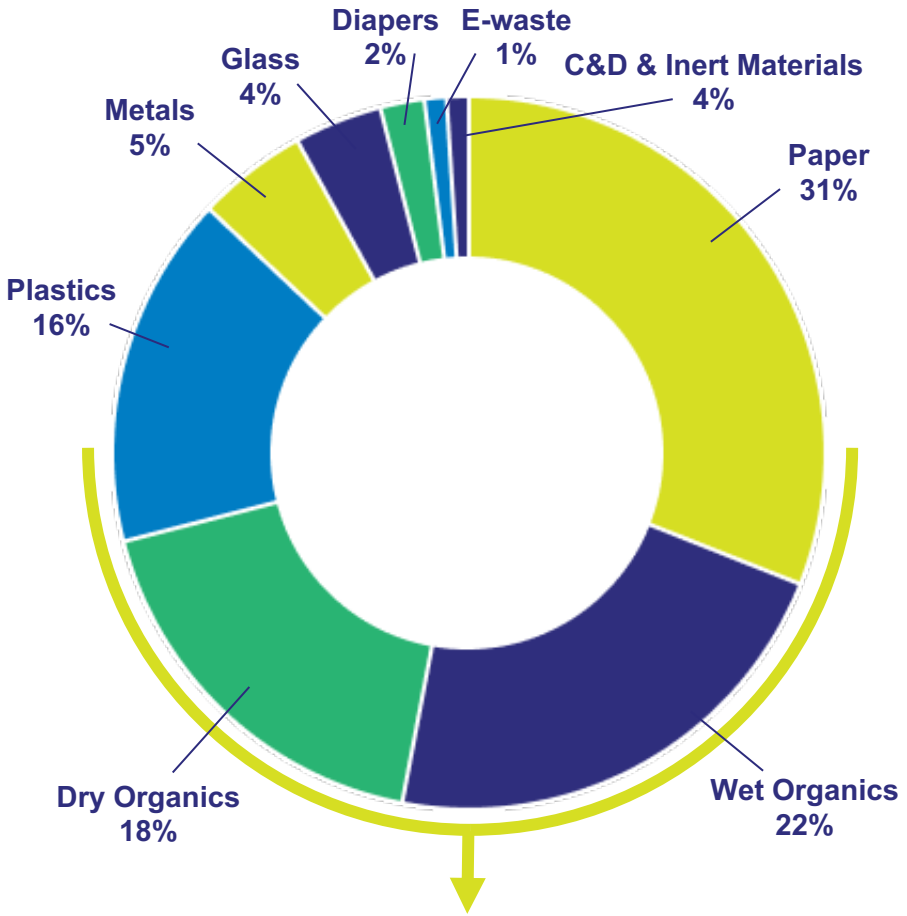
~25%

recovery of discarded materials, including yard waste

>$150

billion in potential product value buried or burned each year

The current circular economy landscape is fragmented. A system-wide solution will handle the entire waste stream



The SMART Center™ creates a full materials re-use ecosystem to address the entire waste stream and build an economic powerhouse, while cutting transportation costs and GHG emissions.

Paper – New players in the paper industry use recycled feedstock, including Clean Fiber and Georgia Pacific's *Juno*.

Organics/Anaerobic Digestion (AD) – Municipalities are expanding organics collection programs, adding to their waste pick-up routes and costs. While these programs divert waste from landfills, they are generally not profitable and may not significantly reduce greenhouse gas emissions; their economics are driven by gate fees and new regulatory mandates rather than the inherent value of the materials they process.

Plastics – Innovations including chemical recycling, advanced sorting, and compostable bioplastics are attracting major players in the packaging industry. But many solutions are grade-specific, and are vulnerable to fluctuating commodity prices, accrue higher transportation costs, and often rely on external sources of feedstock.

Glass – Because of the limited viability of post-consumer glass recovered at MRFs, effective glass recycling often requires additional collection programs and separate infrastructure.

Growing investment in recycling focuses on individual technologies and consumer behavior – rather than on solutions developed to process the entire waste stream

The waste management industry is characterized by rapid vertical integration, consolidation, and innovation, and is fueled by significant investment and M&A activity.

M&A Spending (2019 - Q3 2022)		
	Number of Acquisitions	Total Spent on M&A
Casella Waste Systems	~33	~$360.35M
GFL Environmental	>84	>$6.763B
Republic Services	>24	>$4.799B
Waste Connections	~85	~$3.467B
WM	~38	~$5.399B

Source: Waste Dive

MRF Upgrades – While MRF technology has improved in recent years, traditional recycling still relies on inefficient collection infrastructure and skims a limited number of materials for sale into variable commodities markets.

Waste to Energy (WTE) has received investments but misses the opportunity to put all materials to their highest and best use.

Recent announcements include:

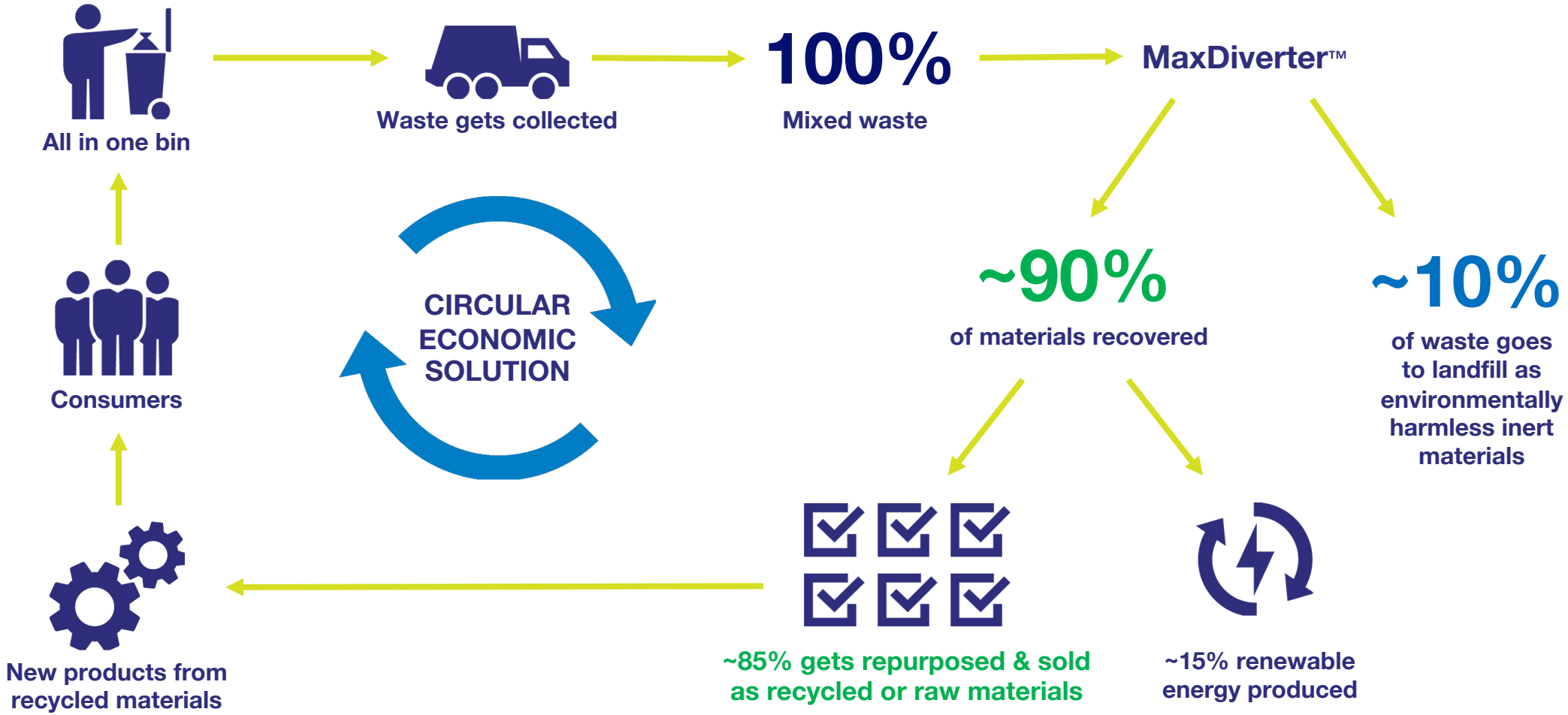
- Circular Services, a private recycling company created by Brookfield and Closed Loop Partners (Nov. 2022) will bring together existing material-specific companies owned by Closed Loop
- The Recycling Partnership's five-point plan to "fix recycling" calls for consumer education and greater investment in recycling technologies
- The American Chemistry Council's Nov. 2022 report on secondary MRFs suggests that "advanced sortation" could capture >50% of materials currently considered waste

None of the current or proposed solutions approach Upland Road's ability to capture ~90% of the waste stream for re-use

02

SMART Centers™ Are The Future

Our solution transforms waste into its highest value with robust, efficient infrastructure



Combining technology and infrastructure on an advanced materials campus unlocks greater value from discarded materials and reduces cost for municipalities and consumers

A SMART Center™: Proven technology sequenced in a new way

The SMART Center™ is a unique, patented system based on **proven commercial technology** and sequencing that processes ~2000 tons/day of waste and transforms it into finished recycled goods, clean energy and soil amendments.

CIRCULAR	COMPREHENSIVE	INNOVATIVE
A comprehensive circular solution replaces the inefficient linear system and captures new value	Converts ~90% of discarded materials into valuable, sustainable products and clean energy	Patented, guaranteed and profitable; backed by world leading companies

Upland Road owns 24 U.S. and international patents covering SMART Center™ processes

Proven commercial and operating performance in Norway and Spain

The equipment and processes in our SMART Centers™ have been proven in commercial use and have demonstrated excellent results.

The facility in Oslo, Norway has been in operation by Norwegian waste firm RoAF since 2016 using "MaxDiverter™ 2.0" equipment with 70 separation steps in sequence and full automation.

The Oslo facility was designed and installed by Stadler in 2015. It represents the full mixed-waste mechanical sorting system proposed for US SMART Centers™. Its recovered materials are sold into the EU market.

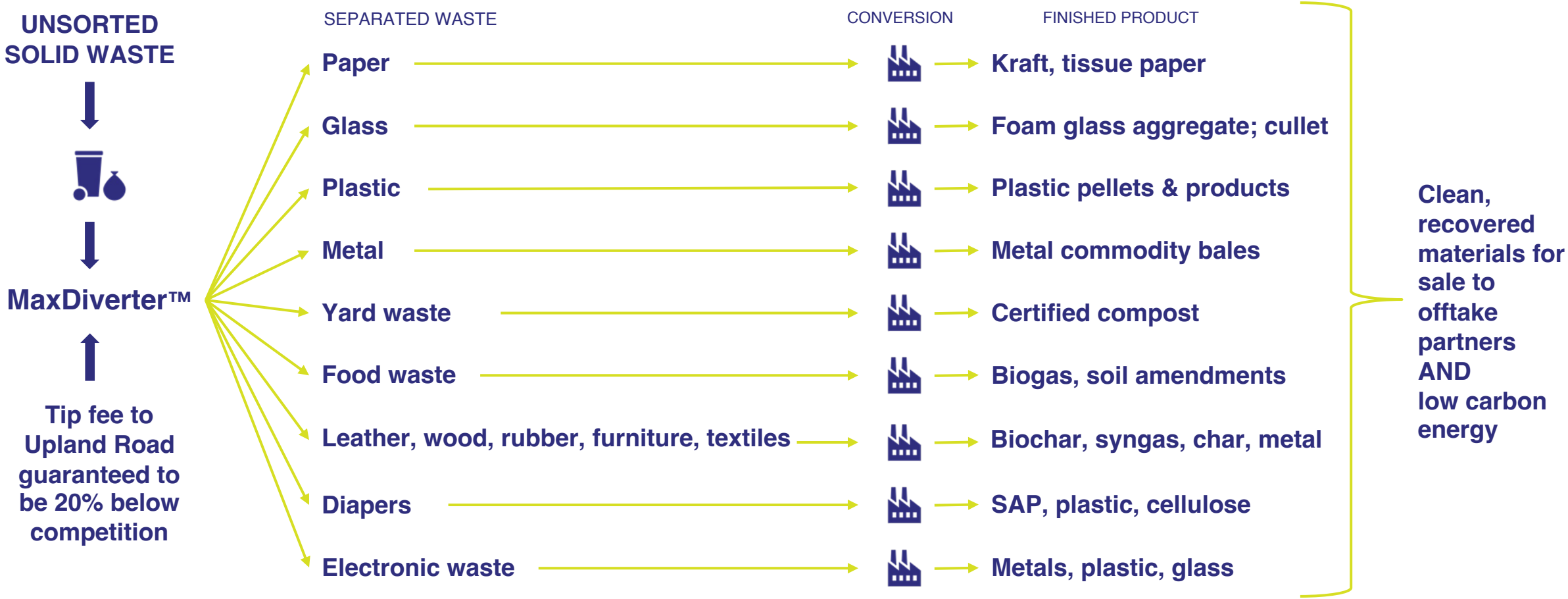
EcoCentral, a mechanical/biological treatment facility engineered by Stadler, uses the wet/dry equipment sequencing of the MaxDiverter™ spread across three separate facilities to achieve 90-95% separation.

The Granada facility was designed and built in 2013-14 and has been operating since 2015.

03

SMART™ is Better and More Profitable

SMART Centers™ gain their economic value from on-site production and co-location with off-take partners



SMART™ value propositions

LOCAL COMMUNITIES

>20%
reduction in waste management costs

~2,000
direct and indirect jobs created by the SMART Center™

~90%
diversion of materials sent to SMART Center™ from the landfill

>1 million
tons of CO2e emissions reduced each year

COMPANY PARTNERS

>20%
reduction in waste management costs

Up to 100%
recycled content product and packaging feedstocks

5-20
year recycled material supply contracts possible

>1 million
tons of CO2e emissions reduced each year. Verifiable back-up documentation will be provided

WASTE BUSINESSES

25-40%
reduction in garbage trucks needed to service the same customers

~90%
annual landfill airspace saved compared with status quo

~20%
lower processing fee for materials delivered to the SMART Center™

~20-50%
potential per-ton profit increase from Resource Rights Payment to qualifying partners

SMART Center™ environmental benefits

Carbon Savings:

1.25 million tons CO2e per SMART Center™ per year

Energy Savings:

Up to: **6.1 million** MMBtu per year (equivalent to annual energy of 67,000 households)

Tree Savings for a 2,000 tons-per-day SMART Center™*

Approximately: **5 million** trees per year

Water Savings*

Approximately: **11 billion gallons** per year

*Assumes a 1,200 tons-per-day kraft paper mill onsite

04

Experienced Team and Partners

Key management biographies

Jeffrey A. Smith, Managing Principal

Jeff is a retired partner of Cravath, Swaine and Moore LLP, where he founded the environmental law practice. For the past 40 years, he has advised companies, financial institutions, and their boards in every industry around the world on all facets of environmental transaction management and the role of capital markets. Jeff is a graduate of Harvard College and received his law degree from the University of Pennsylvania.

Rob Watson, Principal

Known as the “Founding Father of LEED,” Rob has worked for over 35 years as an international leader in market transformation & has achieved LEED Certification for over 40 million ft^2 projects. Rob also has launched the Solid Waste Environmental Excellence Performance (SWEEP) Standard, building on his LEED experience. Rob is a graduate of Dartmouth College, has an MSc from UC Berkeley, and an MBA from Columbia.

Bob Ehlers, Principal

For decades, Bob has worked with leading multinational companies to develop, evaluate & improve corporate Environmental Management Systems (EMS). He is an innovator in EMS thinking and has successfully completed hundreds of site investigation and remediation projects. Bob has a BS in Biology from Fairfield University and a Masters in Environmental Engineering from SUNY Stony Brook.

Rick Pooler, Principal

Rick is Upland Road’s General Counsel. He was an accomplished Senior Counsel/Engineer at Bristol-Myers Squibb. Rick has extensive national and international experience with multifaceted projects in the U.S. and over a dozen other countries. Rick has a BS in Environmental Engineering from Rensselaer Polytechnic Institute and a JD from Syracuse University College of Law.

Anne-Marie McGonnigal, Principal

Anne-Marie is Upland Road’s Director of External Affairs. She is an expert in building strong programs at the intersection of the private and social sectors. Anne-Marie has held senior roles in the U.S. and Europe in corporate sustainability/ESG, fundraising and communications in industries ranging from telecommunications to financial services. She has a BA from Mount Holyoke College and an MBA from the University of Washington.

Partners: Leading companies will ensure end-to-end quality and consistency for SMART Centers™

Build	Some of the world's largest construction companies have assessed and approved our engineering and working systems and are willing to provide a full EPC performance guarantee.
Integrate	Stadler, the world's largest and most experienced waste processing system integrator, will supply and guarantee the performance of the MaxDiverter™ sorting and material recovery system.
Deliver Systems	IBM, Siemens and others will provide facility control optimization and instrumentation, measurement controls management, and logistics optimization.
Finance	Several major firms, including Morgan Stanley, have expressed interest in acting as lead arranger for, or participating in, debt and equity project financing.
Buy	CellMark, a leading broker for recyclable products and commodities, will purchase SMART Center™ outputs.

Additional Background

SMART Center™ of Excellence: Opportunity and innovation

Each SMART™ Campus will include a Center of Excellence in Sustainable Materials Management

The Center of Excellence (COE) will foster innovative sustainable materials management research and green economic development.

In partnership with local universities, COEs will:

- Lead developments in materials science research
- Provide job training for employees to build new skills and advance careers
- Incubate new businesses focused on creating new products from recovered materials
- Train community members interested in working at the SMART Center™ with priority to under-represented populations
- Host community engagement and educational activities onsite

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