

**INDUSTRIAL DECARBONIZATION REPORT 2024** 

## Built to Decarbonize.™

ARAATAGLANCE

#### Letter to investors

In 2024, Ara completed the successful exit of Priority Power our most successful exit to date, and a clear validation of the commercial value of making decarbonization a core strategic lever.



Charles Cherington Managing Partner



As an independent energy management services firm, Priority Power plays a critical role in enabling its clients to reduce emissions, optimize energy usage, and improve infrastructure resilience. Throughout our ownership, Ara worked closely with management to formalize this value proposition aligning decarbonization outcomes with operational performance, customer delivery, and long-term growth. That discipline didn't just drive impact—it created enterprise value that will scale with the company under new ownership. **This is the model**.

We remain focused on codifying this approach across the portfolio—embedding decarbonization into underwriting and strategic plans, establishing operational mandates tied to emissions reductions, and supporting management teams with commercial playbooks that endure beyond our ownership. From diligence through post-exit engagement, we aim to institutionalize long-term decarbonization performance while delivering superior risk-adjusted returns.

Near-term, the broader market environment continues to evolve. Inflationary pressures, protectionist trade policies, and a more uncertain regulatory backdrop have introduced new challenges for lower-carbon-focused businesses. These dynamics may temporarily delay scaling plans and affect capex assumptions for select industries—particularly those reliant on crossborder supply chains or subsidy-driven economics. But these geopolitical conditions also sharpen our focus. Ara companies are built to out-perform through volatility. We back businesses with strong customer demand for low-carbon solutions, advantaged cost structures, and clear roles in enabling energy security, reshoring industrial supply chains, or decarbonizing critical sectors. Ara-backed companies are building the backbone of futuredefining industries. These businesses not only accelerate the transition to a low-carbon economy but also reinforce strategic sectors that are vital to long-term economic resilience and national security. Many benefit from long-term feedstock and offtake agreements, with commercial differentiation that unlocks value across cycles. Where needed, we've acted quickly—streamlining operations, optimizing supply chains, and expanding commercial and business development capabilities across the portfolio.

We continue to evolve the Ara platform in support of this strategy–strengthening our Ara Portfolio Services (APS) team by adding resources and capabilities to our Decarbonization, Government Affairs and Builder teams, and investing in the talent and tools that support rapid scaling across our portfolio companies. With healthy pipelines and fresh capital across our Private Equity and Infrastructure strategies, also launching the Energy strategy—our diversified platform is well positioned to lead in this next chapter of the energy transition.

Our thesis remains unchanged: industrial decarbonization is a long-term, generational investment opportunity—and Ara is built for it. Thank you for your continued partnership.

#### Built to Decarbonize™

#### ARAATAGLANCE

## Ara Partners is a global private equity firm that is decarbonizing the industrial economy



We specialize in buyout, growth equity, infrastructure, and transition investments, targeting sectors that are difficult to decarbonize and often overlooked.

We invest in proven technologies, back businesses that help these to grow, and build decarbonization infrastructure on the ground.

We bring specialist investing, decarbonization, and operational expertise to accelerate the growth and value of businesses that can deliver meaningful decarbonization results in a cost-efficient way.

SIZE

6.2<sub>BN</sub>

assets	underr	nanage	ment

PEOPLE

global team members with specialist expertise<sup>2</sup>

PORTFOLIO

25

companies<sup>2</sup>

PRIVATE EQUITY AND INFRASTRUCTURE TARGET

reduction in greenhouse gas (GHG) emissions at the product, service, or asset level compared to market incumbents<sup>3</sup>

**RESULTS: GHGEMISSIONS** 

1 7м metric tonnes of CO<sub>2</sub>e reduced in 2024<sup>4</sup>

**RESULTS: WASTE** 

542

metric tonnes of waste reduced in 2024<sup>4</sup>

1 AUM as of December 31, 2024 and includes co-invest. 2 As of 12/31/2024.3 For illustrative purposes only. Reductions include amounts directly resulting from Araportfolio company operations, in addition to reductions realized by third parties as a result of services provided by portfolio companies. Applicable only to portfolio companies in PE and Infra Funds. There can be no as sur ance that these targets will be met, and actual reduction of CO<sub>2</sub>e emissions will vary substantially depending on a number of fact ors.<sup>4</sup> Absolute/realized emission reduction amounts calculated irrespective of Ara's %

equity share. 2024 data is based on best available information from the company and third-part y analysis, and relies on certain assumptions. For illus trative purposes only. Reductions include amounts directly resulting from Ara portfolio company operations, in addition to reductions realized by third parties as a result of services provided by portfolio companies. Excludes cross fund investments.

#### Table of contents

#### Our strategy

- 6 Targeting a generational investment opportunity
- 7 Private Equity
- 8 Infrastructure
- 9 Energy
- 11 Ara advantage

#### Decarbonization value creation and exit execution

- 13 Decarbonization pillars
- 14 Executive summary
- 15 Decarbonization-integrated investment life cycle
- 16 Decarbonization operating capabilities
- 17 Exit strategy
- 18 Priority Power exit case study

#### Investment themes

- 21 Investment expertise
- 22 Chemicals and materials
- 25 Energy efficiency and green fuels
- 28 Industrial and manufacturing
- 31 Food and agriculture
- 33 Power
- 36 Infrastructure

#### Appendix

- 40 Glossary
- 41 Disclaimer & confidentiality





## Our strategy

#### OUR STRATEGY

#### Targeting a generational investment opportunity

Our strategies commercialize, scale, and reshape companies and assets that are critical to create a competitive lower-carbon economy.

Decarbonization efforts have largely focused on the 41% of global GHG emissions coming from the power sector<sup>1</sup>, with an overwhelming amount of climate-focused capital investment directed towards wind, solar, battery storage, and electric vehicles (EVs).

A huge increase in decarbonization investment in the right places—is required to achieve climate mitigation objectives in a cost-competitive way. In addition to the power sector, capital must be mobilized towards 'the world of made things,' targeting high-impact industrial sectors, including manufacturing, chemicals and materials, food and agriculture, and supply chain businesses.

Our growth equity and infrastructure investment strategies focus on the high-polluting areas of the industrial economy, helping to strengthen national security and competitiveness, and provide the products and services we all rely on with less waste and lower GHG emissions.

Our latest addition, Ara Energy, is the third pillar of our decarbonization strategy, targeting the root causes of industrial pollution.

#### **Private Equity**

We invest in proven technologies that are displacing existing, polluting industrial processes, as well as the businesses that provide products and services to decarbonization platforms.

#### Infrastructure

We build new infrastructure and repurpose high-quality existing assets that are required to underpin a lower-carbon economy.

#### Energy

We acquire existing, commissioned power generation, biofuels, and distribution businesses to assume full operations and implement a multilayered approach to decarbonization in a commercially viable way. 62%

global CO<sub>2</sub> emissions are generated by power and industrial sectors<sup>1</sup>

## 90%

energy-transition capital investment directed towards "mature" sectors: electrified transport, renewable energy, and power grids<sup>2</sup>

**2.1**TN

annual global investment in energy transition technologies<sup>2</sup>

#### We provide:



#### DIFFERENTIATED CAPITAL

Investing in companies in North America and Europe that decarbonize via fossil fuel displacement at cost parity, increased efficiency, affordability, infrastructure development, and circular solutions.

#### SPECIALIST EXPERTISE

Scaling businesses and infrastructure and advancing best-in-class processes to maximize the decarbonization potential of our portfolio.



#### NETWORK AMPLIFICATION

Leveraging customer and industry connections and strategic partnerships to drive commercial outcomes and unlock new markets.



#### **OPERATIONAL RISK MITIGATION**

Optimizing operational practices and minimizing risk by improving operational performance and decarbonization measurement and management.

Sources: 1 BNEF, "New Energy Out look 2024", 2024; 2 BNEF, "Energy Transition Investment Trends 2025", 2025.

#### OUR STRATEGY

#### **Private Equity**

We provide the capital and expertise required to bridge the gap between IP and real assets.

#### Targeting the 'missing middle'

While there has been an increase in climate-focused investment, the majority of capital is being deployed at two opposing ends of the energy transition market-venture financing and infrastructure. The result of this is the creation of the 'missing middle' a gap in the funding and skills needed to support companies that have matured out of the venture stage but yet to have de-risked or scaled their operations enough to access mature-stage capital.

The lack of this kind of investment means that critical early-stage technologies that are needed to meet global GHG emissions reduction will struggle to achieve full-scale deployment.

Our Private Equity strategy addresses this challenge, commercializing proven technologies and backing the businesses that help them grow, while advancing national competitiveness.

### We take a dual-approach to industrial decarbonization

Process Technology Rollouts (PTRs): We support companies that have developed proven process technologies to become full industrial enterprises. We help these businesses scale and build new plants, guiding them through planning and execution at all stages of the process while identifying new opportunities to improve their decarbonization potential.

**Decarbonization enablers**: These businesses are the catalysts for delivering industrial decarbonization, providing essential products and services to the wider decarbonization ecosystem. We partner with companies as their first institutional owner, strengthening the fundamentals of their business and driving growth and decarbonization impact.

### PTR spotlight: Scaling proven, low-carbon industrial solutions

Ara fills the critical gap between breakthrough innovation and commercial scale. We invest in proven, de-risked process technologies—past the demo stage but not yet widely deployed and build the first five to ten plants. These initial deployments create the blueprint for efficient replication, enabling strategics or mega-cap private equity firms to take over and scale with confidence.

The technologies we back are costcompetitive and at least 60% less carbon intensive than incumbents, giving them true "category killer" potential to fully displace legacy processes.

Now in our third PE fund, we've refined a repeatable playbook for PTRs. We know the exact markers of a successful rollout, from construction timelines and capital intensity to offtake structure, supply stability, and total addressable and serviceable market.



#### OUR STRATEGY

#### Infrastructure

We see a growing opportunity in the mid-market, building new infrastructure and repurposing highquality existing assets for a low-carbon economy.

The industrial sector remains highly fragmented. The limited presence of institutional capital in the midmarket creates opportunities to acquire and scale high-quality businesses with multiple levers for value creation—including operational improvements, technology upgrades, and strategic repositioning.

Over the last decade, infrastructure investors have increasingly moved up-market, leaving behind a deep pipeline of investable opportunities in smaller-scale transactions. This dynamic reduces entry competition, provides greater project level diversification and creates more pathways for attractive exits, including to larger financial sponsors and strategics who have outgrown the space.

We also have a front-row seat to new infrastructure opportunities as assets grow beyond private equity backing. We leverage our owner, builder, and operator expertise along with our differentiated industry network to support these mid-market companies as they execute the next stage of their growth plans.

Our mid-market focus allows us to target smaller projects with less competition and greater diversification benefits. We focus on developing new and repurposing existing mid-market infrastructure to serve the low-carbon economy.

**Low-carbon molecules:** The production, storage, and distribution of low-carbon fuels (i.e., biofuels and renewable natural gas).



Industrial energy efficiency: Enabling decarbonization across the full infrastructure value chain (i.e., refueling infrastructure, grid solutions, energy efficiency).

## Building assets with attractive risk-adjusted returns:

- > Downside protection: Expected to achieve "core" infrastructure returns by targeting commercially established, credit worthy assets with near-term yield and long-term contracts.
- > Base case value-add returns: Enable strong base case returns through welldelineated near-term growth opportunities bolstered by milestonebased funding.
- > Upside potential: Provide meaningful upside via additional growth opportunities, expansion potential, and crystallization of pipeline value.



Sources: 1 IOP Publishing, Ltd. "Carbon intensity of corn ethanol in the United States: state of the science," 2021; US Department of Energy sources study done by Argonne National Laboratory which gives a 44%-52% range in "Corn et hanol reduces carbon foot print, greenhouse gases," study, 2021.

#### OUR STRATEGY

#### Energy

We target the root cause of industrial pollution, optimizing the energy value chain and tackling emissions at the source.

Ara Energy capitalizes on enduring energy market fundamentals and evolving power sector dynamics. We prioritize carbon removal at the source—where emissions are highly concentrated, and abatement is measurable—rather than waiting for the perfect asset or policy environment.

Our thesis is grounded in the belief that a ton of carbon avoided today is more valuable than a ton avoided tomorrow. That principle drives us to act on opportunities that yield meaningful GHG emissions reductions now, even within conventional energy systems.

We've diversified our strategy to take on one of the toughest industrial decarbonization challenges: power generation. Ara Energy acquires and improves critical energy assets—including generation, fuels, and bio-based distribution infrastructure—with the goal of delivering commercial and emissions upside in parallel.

By deploying capital into these heavily polluting areas and applying engineering, technical, and operational solutions, we aim to transform assets' emissions profiles from within the energy system, rather than ignoring them until cleaner solutions are ready at scale to displace them. We project that Ara's financed GHG emissions footprint will initially grow as we deploy seed capital into this fund. But as we implement decarbonization technology over time, there is potential to achieve outsized decarbonization gains, given the scale of the GHG emissions reduction challenge.

These benefits will likely be realized directly within the assets' operating footprint rather than within the larger value chain, creating a conclusive decarbonization outcome.



We invest across the power and fuels value chain—where decarbonization today delivers the biggest return.

**Power generation:** We acquire conventional generation assets in merchant markets and improve their performance, emissions profile, and reliability.

**Biofuels production:** We invest in lowcarbon fuel platforms like ethanol that are already commercial, scalable, and in demand.

 Distribution / delivery: We enhance
 downstream infrastructure to expand access to cleaner fuels—supporting efficient blending, storage, and transport.

## Ethanol is a ready-now decarbonization lever

Ethanol is one of the most commercially viable low-carbon fuels on the market today, delivering a 46%<sup>1</sup> lower life cycle carbon footprint than gasoline and offering immediate emissions reductions across the transport and industrial sectors.

Ethanol also serves as a cost-effective decarbonization platform:

Nearly 99.5% pure  $CO_2$  is produced as a by-product of ethanol production–making it one of the cheapest and most scalable sources for carbon capture and processing.

With rising demand driven by E15 mandates, SAF blending, and the global push for fuel security, decarbonized ethanol is an increasingly attractive feedstock for the energy sector.

INDUSTRIAL DECARBONIZATION REPORT 2024

#### OUR STRATEGY

#### Energy (continued)

We have combined investment know-how with engineering, technical, operational capabilities, and unmatched carbon expertise to decarbonize existing energy infrastructure.

We focus on transforming and decarbonizing the energy value chain in a commercially viable way.



Acquiring conventional energy assets at attractive valuations: We seek attractive assets with additional upside from market fundamentals, optimization, and energy transition perspective.



**Commercial optimization and operational upside:** We execute optimization strategies of the assets using commodity markets, monetizing hourly optionality, and operating as a portfolio.



Adding terminal value through decarbonization technology: We perform detailed decarbonization

perform detailed decarbonization modeling and deploy GHG emissions reduction levers in a cost-efficient way.

### Developing our decarbonization management approach:

We have partnered with Sargent & Lundy, a global leader for the power and engineering industry, to assess the cost efficiency and decarbonization potential of each investment:

- Commercial viability, cost, and technical feasibility of decarbonization technology deployment.
- Facility-specific operating footprints (Scope 1, 2, 3 GHG emissions), industry benchmarks, Ara financed GHG emissions, and compliance costs with carbon pricing mechanisms.
- Facility-specific Marginal Abatement Cost Curve (MACC) and near-term, mediumterm, and long-term decarbonization levers.
- A Decarbonization Plan based on key technical screening criteria, e.g., Technology Readiness Level (TRL), expected IRR, ERP, carbon abatement cost, time to implement, and operating risk.



OUR STRATEGY

#### Ara Advantage

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Our approach to value creation is designed to maximize decarbonization results while accelerating the growth of our portfolio companies.

Where most firms advise, Ara builds—bringing unmatched industry depth and hands-on portfolio leadership to every investment. Our teams share insights, networks, and operational expertise across strategies, giving us a differentiated view of the market and a stronger platform for value creation.

## Research, partnerships & commerce

Our centralized research and relationshipbuilding function strengthens sector insight and unlocks strategic partnerships across our portfolio, accelerating commercial development.

#### sveto pinent.

#### Decarbonization

We help businesses to establish best-inclass operational practices, implement gold-standard carbon accounting and support the development of long-term decarbonization plans to enhance their commercial value and return profile.

## Built to Decarbonize.™

Builder and operator specialisms We provide businesses with specialist technical, engineering and operating expertise and guide them through best-in-class project delivery practices to help build large-scale industrial assets.



11

#### Government affairs

We engage and advise on the policy decisions that affect our businesses, helping them to navigate the complexities of regulatory change, manage risks and identify opportunities for growth.



# Decarbonization value creation and exit execution

#### **Decarbonization pillars**

We take a dual approach to industrial decarbonization, focusing on two primary pillars that are integrated and evaluated across our investments.



For our Private Equity and Infrastructure strategies, we target investments that directly contribute to the reduction of GHG emissions at cost parity, with the potential to deliver 60% GHG emissions reduction at the product, service or asset level compared to the market incumbent.<sup>1</sup>

Waste mitigation

We invest in businesses that contribute to the circular economy by using new technologies and building infrastructure to circular materials that reduce and recycle non-biodegradable waste. This transition represents a long-term shift in supply chains with a key market for material-efficient industrial solutions.

<sup>1</sup> For illustrative purposes only. Reductions include amounts directly resulting from Ara portfolio company operations, in addition to reductions realized by third parties as a result of services provided by

portfolio companies. There can be no assurance that these targets will be met, and actual reduction of CO2e emissions will vary substantially depending on a number of factors.

#### **Executive summary**

Our performance highlights the success of our private equity and infrastructure strategies and underpins our approach to value creation.

#### Emissions Reduction Potential (ERP)

2024 realized

1.7<sub>M</sub> metric tonnes CO<sub>2</sub>e reduction<sup>1</sup>

EQUIVALENT TO AVOIDING

399.5к

passenger vehicles driven for one year<sup>2</sup>

#### Waste Reduction Potential (WRP)

2024 realized

542ĸ

metric tonnes of waste reduced<sup>1</sup>

#### EQUIVALENT TO AVOIDING

**77.4**K garbage trucks' worth of waste<sup>2</sup>

#### Impact thesis

We believe in the alignment between decarbonization and delivering financial performance.

#### Investment themes

We see several investing themes tied to industrial decarbonization that provide long-term attractive tailwinds in the chemicals and materials, energy efficiency and green fuels, industrial and manufacturing, food and agriculture sectors.

#### Strategies

Our strategies continue to deliver immediate decarbonization returns while driving a shift to the circular economy:

- > Private Equity: We are addressing the funding and skills gap needed to scale technologies and processes, and back the businesses that enable industrial decarbonization.
- Infrastructure: We see a growing opportunity in the mid-market, building new infrastructure and repurposing high-quality existing assets, capitalizing on a first mover advantage.
- Energy: The world will rely on conventional energy to meet power demands in the short to medium term. Ara's specialist approach uniquely positions us to decarbonize conventional energy in a commercially viable way.

Note: Emissions data for this strategy will be included in future reports after a full year of asset ownership and operation.

<sup>1</sup> Absolute/realized emission reduction amounts calculated inespective of Ara's % equity share. 2024 dat als based on best available information from the company and third-party analysis, and relies on certain assumptions. For illustrative purposes only. Reductions include amounts directly resulting from Ara portfolio company operations, in addition to reductions realized by third parties as a result of services provided by portfolio companies. Excludes crossfund investments. Passengerve hide and garbage truck equivalency based on 2024 BPA GHO Equivalencies Calculator.

14

#### Decarbonization-integrated investment life cycle

We integrate decarbonization considerations into all aspects of investment decision-making and portfolio management to drive margin expansion and exit multiples.

I. Sourcing	II. Diligence		III. Value creation	n (7	
Screening Complete preliminary due diligence, assessing decarbonization profile and investment strategy alignment.	Gate 1: Scorecard Assessing ERP, fund strategy, operational performance, operating risks, and value creation opportunities.	PROCE      Gate 2: Baseline      Questionnaire and KPI     benchmarking with in-depth     review of emissions reduction     potential and operational     performance themes.	SS STEPS Integration Onboarding and collection of operating and carbon data, including Scope 1-3 GHG emissions, climate risk, and carbon and waste savings models.	Performance plans Develop annual operational performance assessment, including key risks and risk mitigation activities, and strategic engagements.	Exit strategy Decarbonization governance model, corporate and commercial strategy, and value chain management optimized for exit.
Provides initial screen of acceptable investments aligned to Ara's investment theses.	Underscores key operational and commercial opportunities and risks to steer further diligence and investment decision-making.	SUPPORTING N Ensures an investment's decarbonization profile aligns with Ara's investment thesis and fund strategy considerations.	/ALUE CREATION Operational and carbon data used for securing capital and offtake agreements, while also enhancing operational oversight and management.	Operational and risk management plans enforce bottom line and corporate/commercial strategy engagement aid top line growth.	Decarbonization performance and management profile leveraged in exit negotiations to increase exit multiples, reduce risk exposure, and drive market differentiation.

We bring together the specialist expertise to support our investment strategy, advance portfolio company operations, and enhance investment value at exit.



### Carbon underwriting and management

- > Collect, calculate, and validate GHG Protocolaligned, portfolio-wide Scope 1–3 emissions to monitor emissions performance and identify cost-efficient emission reduction levers.
- > Oversee ISO-compliant product carbon intensity analysis and develop carbon savings model to enhance production process design, commercial offtakes, exit negotiations, and fundraising.



Business process design and optimization

- > Embed robust data management and operational oversight practices within organizations to streamline data access and operational workflows.
- Integrate decarbonization considerations into corporate strategy, financial planning, and governance frameworks to reduce costs and optimize resource expenditures, product market fit, and business continuity.



### Fund strategy and market positioning

- Monitor evolving decarbonization regulatory landscape to assess fund level risk exposure, compliance costs, and commercial opportunities tied to decarbonization and waste reduction.
- > Track capital markets and economic market drivers to optimally position companies and/or funds to capitalize on emerging capital formation trends and market tailwinds.



### Risk and operational management

- > Conduct climate risk analysis, modeling exposure and financial impact of current and projected physical climate risks, uncovering portfolio value loss and enabling proactive risk mitigation and resilience planning.
- > Collect and manage operational and health, safety, and environment (HSE) data, enabling sharper cost control and margin improvement through identification of performance gaps, risk exposure, and value creation areas.

17

We calculate projected impact and aim to lock in long-term decarbonization potential while delivering superior risk-adjusted returns.

Baseline and projections	Exit operations	Company exit support	Post-exit engagement
Exit considerations are integrated across the entire lifecycle of an investment.	Decarbonization is typically integral to the commercial value proposition of our Private Equity and Infrastructure investments.	We are taking steps to drive internal alignment and institutionalize our management approach and exit protocols.	Continued realization of long-term GHG emissions reduction extends beyond the hold period.
<ul> <li>&gt; Ara develops an underwiring case and financial model in diligence, which inform GHG emissions and waste reduction projections (e.g., 2030 ERP and 2030 WRP).</li> <li>&gt; These models and metrics are continuously reviewed based on the evolution of the annual</li> </ul>	<ul> <li>Ara works to embed carbon management principles, commercial excellence, operational maturity execution, best-in-class HSE governance, and public policy insights across its portfolio.</li> </ul>	> Ara is uniquely positioned to cultivate the buyer universe and support management during buyer diligence and/or IPO preparation, capitalizing on an extensive data record in business management, and operations and decarbonization performance.	<ul> <li>Exit management approach includes steps to ensure a successful transition of ownership, such as post-exit data retention protocols, smooth offboarding from Ara SaaS systems, and handover to management teams for historic records.</li> </ul>
financial models, audited financials, and operational data. Ara considers both risks to exit and risks to achieving sustained impact.	<ul> <li>Mandates for programmatic and business model changes are instituted to position for exit and ensure that decarbonization impact outlasts ownership changes.</li> </ul>	> Ara sets pre-exit performance milestones and holds management accountable. Dedicated Ara decarbonization and portfolio services teams actively support management on exit planning and clease out at low Are initiation.	Post-exit ad hoc and periodic engagement with management teams helps offer insights, determine business evolution, and monitor how the impact has been sustained over time, including exit interviews and case studies.
	Decarbonization is selectively considered in buyer screening, engagement, external financing, and other capital formation initiatives, aligning with management teams on exit scenarios, timing, structure, and process.	<ul> <li>Ara IC exit memo assesses exit scenarios, deal timing, exit readiness, investor contribution, exit structuring and buyer-alignment considerations.</li> </ul>	<ul> <li>Ara portfolio advisory and technology services remain available to management teams to efficiently manage and preserve decarbonization impact.</li> </ul>

#### EXIT MANAGEMENT ACTIONS

Realized and projected emissions and waste impact, operating data, carbon and climate risk measurement		Data retention protocols
Performance planning and milestones to position for strategic exit or IPO		Management team handover
"Day of" support and investor engagement		Advisory support

DECARBONIZATION VALUE CREATION AND EXIT EXECUTION

#### Priority**Power**

Fund I

#### SECTOR **Energy efficiency** and green fuels

#### STATUS Exited

INVESTMENT DATE

Feb 2019

#### EXIT DATE Sep 2024

#### Leveraging market tailwinds and Ara's decarbonization owner-operator model to deliver a successful exit.

#### Overview

Priority Power provides power management services to commercial and industrial customers and develops and operates renewable grid infrastructure. It delivers unmatched energy optimization and infrastructure solutions that reduce costs, Scope 2 emissions, and time to interconnection for industrial clients.



#### Macro tailwinds

Priority successfully expanded operations since 2019 to become the largest independent provider of integrated C&I energy services. The company was able to capitalize on US energy megatrends by:

- > Using its energy procurement and data/advisory services to minimize increasingly higher and more volatile energy prices (>1\$BN annual energy spend managed).
- > Monetizing load flexibility to reduce costs through its load and asset management services.
- > Upgrading energy infrastructure to make operations less costly, more resilient, and more sustainable.

#### Exit execution

Priority was successfully sold to I Squared in 2024, bolstered by Ara's operational oversight, strategic partner network, and decarbonization focus.

The sale marked the culmination of Ara's decarbonization management process, efficiently managing buyer preferences while ensuring operational excellence and decarbonization impact were maintained post-exit.

#### Ara supported Priority during the exit process via:

- > Customer value positioning and strategic buyer screening.
- > Decarbonization and operational diligence.
- Climate risk management.

#### **Optimizing value at exit**

Following the successful exit of Priority, Ara is building on lessons learned to best prepare companies heading towards exit.

Sample exit checklist (kickoff 12-18 months ahead of potential exit):

- > Creation of performance plan with top five areas of focus, including score card with top KPIs, to drive and monitor progress.
- > Conducting third party audit or validation of operating and emissions data.
- > Reviewing and refreshing key corporate governance policies, including emissions management, waste management, risk management, HSE, and others.
- > When material, commission comparative lifecycle assessment to reflect latest operating data, covering new facilities, products, end markets.
- Consider public market readiness program if evaluating IPO.

#### Priority **Power**

#### Fund I

#### SECTOR Energy efficiency

#### and green fuels



#### INVESTMENT DATE

Feb 2019

#### exit date Sep 2024

#### Value creation

#### INVESTOR FOCUS

- > Recruited an expanded management team and created a board of directors.
- Completed 14 acquisitions since 2019 across power procurement, energy structuring, remote asset management, demand response and solar development business lines.

#### DECARBONIZATION RESULTS

- > Implemented company's first carbon operating model, quantifying and validating its global carbon footprint and developed ERP model for key business lines.
- > Instituted operational, carbon (Scope 1–3 emissions) and climate risk data management systems leveraged for operational management, and customer emissions savings data delivery.
- > Worked with strategic buyers to define decarbonization profile during diligence calls, particularly around carbon savings, emissions profile, and physical climate risk to grid infrastructure.

#### PERFORMANCE AGAINST BASELINE

- > Through M&A strategy expanded from 1.3K to 10K customer contracts.
- > Five new business lines added.
- Priority Power and Ara skillfully navigated the black swan event of Winter Storm Uri and implemented curative actions to protect the company from similar weather events in the future.

#### Key metrics<sup>1</sup>

#### **\$1.3**вм

energy infrastructure developed<sup>2</sup>

#### **6**x

revenue growth of energy management segment since 2019

#### 10,000

Customers in more than 40 states

#### Зх

revenue growth of energy infrastructure segment since 2019

K

## Investment themes

#### ● INVESTMENTTHEMES

#### **Investment expertise**

We invest in the long-term macro trends reshaping industries toward a lower-carbon economy.

We draw on the insights and experience of our seasoned deal team to identify exciting, high-performing investment opportunities.



**Charles Cherington** Managing Partner

25+ years in industrial, energy, and chemical sub-sectors



**Troy Thacker** Managing Partner

25+ years in environmental, industrial, software, energy, and insurance industries



Shameek Konar Partner, Head of Energy

25+ years in industrial, energy efficiency, and digital transformation



Chris Picotte Partner

25+ years in industrial, energy efficiency, and digital transformation



**Cory Steffek** Partner

20+ years in advanced materials and energy



**Teresa O'Flynn** Partner, Infrastructure

20+ years in sustainable investing



**Churchill George Yong** Partner, Infrastructure

15+ years in infrastructure investing



**Tuan Tran** Head of Research, Strategic Partnerships

20+ years in environmental and industrial services, and energy technology investing

● INVESTMENT THEMES - CHEMICALS AND MATERIALS

## Chemicals and materials

This sector is at the center of industrial decarbonization, both as a major emissions source and a driver of low-carbon innovation.

Traditional production processes are heavily reliant on carbon-intensive raw materials, making the industry a prime focus for decarbonization efforts. However, technological advancements, onshoring of manufacturing, supply chain security and industry preferences are accelerating the transition toward sustainable alternatives across various chemicals and advanced materials end-markets.

With strong onshoring and techno-economic tailwinds, the sector is undergoing a fundamental transformation, even in the face of limited policy support. Near-term, the biggest challenge to decarbonizing the chemicals and materials sector is macroeconomic headwinds as the products may require a premium to be economical and drive expansion of production capacity. Ara is taking a particularly close look at the following investment themes shaping the sector:

- > Additive Manufacturing (AM): Scaling of metals recycling and production capacity to produce high quality, metallic 3D printing powders.
- > High-purity alumina (HPA) and advanced materials: Meeting growing demand from semiconductors, batteries, and advanced ceramics.
- > Green Cement and Supplementary Cementitious Material (SCM): Increasing adoption of SCMs to reduce reliance on carbon-intensive clinker material for cement applications.



#### INVESTMENTTHEMES – CHEMICALS AND MATERIALS



#### Additive manufacturing

AM is transforming traditional production by enabling the layer-by-layer creation of complex metal components. This approach enhances design flexibility and significantly reduces material waste compared to conventional subtractive methods.

Integrating recycled metal powders into additive manufacturing advances sustainability and significantly reduces the carbon footprint of production. Companies like Continuum convert 100% scrap material into high-quality metal powder, significantly cutting production emissions.

## 99.7%

maximum possible reduction in emissions when using Continuum powder vs. traditional virgin metal powder production<sup>1</sup>

#### AM OPPORTUNITIES:

- Cost efficiency: Utilizing recycled metal powders can lower raw material costs, offering economic advantages to manufacturers.
- Ŷ Sustainability credentials: Adopting
   recycled materials can enhance
  - companies' environmental responsibility profiles, appealing to eco-conscious consumers and aligning with global decarbonization goals.
- A **Market differentiation**: Offering products manufactured with sustainable practices can serve as a unique selling proposition in competitive markets.
- Onshoring: Unlocking domestic sources for 3D printing materials can strengthen supply chain resilience and reduce dependence on foreign inputs.

#### AM CHALLENGES:

- **Powder quality assurance**: Ensuring that recycled powders meet stringent quality standards is critical. Variations in particle size, composition, and contamination levels can affect the integrity of the final product.
  - **Technological investment**: Implementing advanced recycling technologies necessitates significant capital expenditure and expertise, which may be significant barriers to entry.

## High-purity alumina and advanced materials

The HPA market is on track for significant expansion, particularly in the semiconductor and lithium-ion battery sectors. HPA demand is projected to grow at a 15% compound annual growth rate through 2027, driven by its application in LED lighting, ceramic substrates, and specialty coatings.

5%

expected Compound Annual Growth Rate (CAGR) of HPA market through 2027  $^{\circ}$ 

North American HPA demand is expected to rise sharply, benefiting from increasing semiconductor investments and supply chain security trends.<sup>3</sup>

In the semiconductor industry, technical ceramics– including silicon carbide (SiC), aluminum nitride (AlN), and yttria-stabilized zirconia (YSZ)–are playing an expanding role due to their high thermal stability, corrosion resistance, and electrical insulation properties.<sup>3</sup> SiC-based materials, in particular, are in high demand for power electronics, with Chemical Vapor Deposition (CVD) SiC expected to capture a growing share of the SiC components market.



in current valuation of the SiC components market<sup>3</sup>



possible reduction in emissions when

<sup>1</sup> Up to 99.7% reduction in emissions achieved when using 100% recycled nickel feedstock sourced within 100 km radius through Continuum's Houston facility, supplied with low carbon electricity and argon, to produce nickel-based alloy powder. Continuum Powders, "New product carbon footprint (PCF) study Continue Powders Recycling Technology Cuts Carbon Foot print by 99.7%," 2025. \* KEARNEY, "High Purity Alumina Market Study," 2024. \* TECHCET, "2023-2024 TECHCET's CMR, Ceramic, Fabricated parts, material segment for semiconductor applications," 2023.

#### INVESTMENTTHEMES – CHEMICALS AND MATERIALS



#### Green Cement and Supplementary Cementitious Material

Green Cement incorporates alternative materials and processes to reduce  $CO_2$  emissions associated with traditional cement production. A key component in Green Cement is the use of SCMs, which serve as partial replacements for clinker–the primary ingredient in conventional cement and the main source of its  $CO_2$  emissions.

SCMs, such as fly ash, ground granulated blastfurnace slag, silica fume, and calcined clays, are by-products from other industrial processes. Incorporating these materials into cement formulations offers several environmental benefits.

#### Role of SCMs in decarbonization:

- Reduced clinker content: By substituting a portion of clinker with SCMs, the overall CO<sub>2</sub> emissions from cement production are significantly lowered.
- Enhanced durability: SCMs can improve the durability and longevity of concrete, leading to structures that require less maintenance and have extended lifespans, thereby contributing to sustainability.
- Waste utilization: Utilizing industrial byproducts as SCMs promotes recycling and reduces landfill waste.
- **Carbon upcycling**: Innovative processes that embed CO<sub>2</sub> into materials used as SCMs can further decrease the carbon intensity of concrete by up to 30%, offering a dual benefit of emissions reduction and carbon utilization.

While the adoption of SCMs presents a promising pathway to decarbonize the cement industry, several challenges remain–including limited availability of fly ash and slag, the need for standardization and performance validation through rigorous testing codes, and market resistance to Green Cement due to its higher cost. As cost curves come down, we see significant growth in SCM adoption long-term.



INVESTMENTTHEMES – ENERGY EFFICIENCY AND GREEN FUELS

## Energy efficiency and green fuels

Decarbonization demands a step change in efficiency across power, transport, and heavy industry. Ara sees opportunities to scale green fuels despite today's policy and economic headwinds.

The interplay between energy efficiency, smart grid solutions, and clean fuels will define the next wave of industrial decarbonization–offering strong financial returns and measurable climate impact. There is a concerted push from investors, strategics, and policy makers to modernize aging grid infrastructure and achieve energy security regionally by harnessing all forms of power (green and conventional).

While green fuels face near-term headwinds given high scale-up costs, technology readiness challenges, and the need for massive renewable and hydrogen infrastructure, we see growth in the Sustainable Aviation Fuels (SAFs) market driven by favorable regulations in the EU and UK, favorable incentives in the US, and strong demand pull from airlines. Ara sees significant investment opportunities to achieve energy security and decarbonize industries through:

#### Energy efficiency & electrification:

- > AI-driven industrial optimization.
- > Decentralized power solutions, such as Virtual Power Plants (VPPs) and microgrids.
- > Electrification of industrial heat for lower-carbon manufacturing.

#### Green fuels:

 Longer-term, scalable SAF production, leveraging diverse feedstocks to decarbonize air travel.



#### ● INVESTMENT THEMES – ENERGY EFFICIENCY AND GREEN FUELS



## Energy efficiency & electrification

#### Al-driven industrial optimization

Rather than relying solely on costly new transmission projects, grid-enhancing technologies (GETs) are emerging as cost-effective solutions. GETs include technologies like dynamic line ratings, high-voltage direct current (HVDC) transmission, and Al-driven load optimization.

In industrial settings, energy efficiency remains one of the most cost-effective pathways for near-term emissions reductions. Investment in industrial automation, AI-driven process optimization, and waste heat recovery has grown significantly in 2024, reflecting strong demand for efficiency-enhancing technologies. Speed of adoption of GETs will be dependent on overcoming near-term challenges, namely costbenefit analyses, compatibility and data integration with existing grid systems, reliability, and lack of clear incentive structures.

#### Decentralized power solutions

Additionally, long-duration energy storage (LDES), capable of storing power for days or even weeks, is expected to scale exponentially, with potential capacity exceeding 8 TW by 2040.<sup>1</sup> Decentralized power solutions–including VPPs, microgrids, and demand response programs–will play an increasingly vital role in balancing supply and demand.

LDES deployment is more capital intensive than short-duration storage, making it less economical. The technology remains in early stages of development, with ongoing challenges around energy efficiency, system degradation, and siting or infrastructure requirements. While we see slow adoption near-term, we see strong demand pull for LDES longer-term.

40%

reduction in energy use for data center cooling leveraging Google's DeepMind<sup>1</sup>

20%

maintenance cost reduction delivered by AI-driven maintenance<sup>1</sup>

#### Electrification of industrial heat

At the same time, electrification of industrial heat, while still comparatively expensive, is gaining momentum. Historically, high-temperature industrial processes have relied on fossil fuels, but advancements in electric arc furnaces, highefficiency industrial heat pumps, and resistive heating are enabling a gradual shift toward lowcarbon electricity-powered solutions.<sup>2</sup>

Electrification of industrial heat often does not achieve the ultra-high temperatures necessary for industrial manufacturing, further creating a barrier to broader adoption.

20%

increase in investment in industrial automation, optimization, and waste heat recovery<sup>2</sup>

#### **Policy spotlight**

#### **United States**

The US is experiencing a realignment on subsidies for domestic manufacturing and energy. Previously enacted incentives, like the Inflation Reduction Act (IRA), have encouraged building out clean tech manufacturing and low-carbon supply chains in the United States. Under the current administration, the pace of deployment of grants has slowed. However, there is strong support in Congress and within the administration for increasing domestic production of critical minerals and related products. The post-2025 tax policy outlook remains uncertain, with Congress likely to deemphasize and scale back certain IRA tax credits in the upcoming tax reform package, and focus more on tax savings.

#### Europe

The EU relies on regulations, carbon pricing, and market mechanisms to drive clean technology adoption. The European Commission recently announced the Clean Industrial Deal, investing €100BN to support local clean tech manufacturing and energy security, and Germany launched a €500BN infrastructure fund, earmarking funds for defense, infrastructure and clean tech investments.

● INVESTMENT THEMES – ENERGY EFFICIENCY AND GREEN FUELS

#### **Green fuels**

#### **Beyond traditional biofuels**

Electrification alone cannot solve decarbonization for sectors like aviation, shipping, and heavy industry. This is where SAFs, renewable diesel, and hydrogen-based synthetic fuels play a pivotal role longer-term, although significant near-term headwinds exist for green fuels.

Hydrogen-based fuels-including green methanol and ammonia-are seeing a slowdown in commercial traction, particularly for global shipping and industrial applications, where policy support, particularly in the US, remains in question. Delays in building out green hydrogen infrastructure due to capital intensity, financing challenges, and lack of long-term offtakes, have had a negative effect on growth in the green fuels market near-term-especially in the US.



#### Sustainable Aviation Fuel

The SAF market is scaling steadily, driven by policy mandates in the EU and UK, incentives in the US, airline demand, and investment in new SAF pathways.

- > HEFA and co-processing remain the predominant SAF pathways today: Given their relatively attractive cost profiles and lower capex requirements, enabled by leveraging existing renewable diesel refining infrastructure.
- Expansion of SAF feedstocks: Moving beyond HEFA-based production (waste oils) to Gas-to-Liquids (GtL) and Alcohol-to-Jet (AtJ) pathways offers long-term scalability opportunities for the SAF industry, but capital intensity, technical maturity, and economic viability remain bottlenecks to adoption.<sup>3</sup>

Policy-driven cost parity: With the IRA's SAF tax credits and blending mandates in the EU, price differentials with conventional jet fuel, are expected to narrow over time with economies of scale.<sup>3</sup>

## **3**<sub>x</sub>

current SAF production capacity expected by 2030<sup>2</sup>

However, production remains costly and supplyconstrained, requiring investment in both feedstock scalability and advanced production pathways.

2-5×

higher cost in current SAF production compared to conventional jet fuel<sup>2</sup>

Ara believes early-mover investment in costcompetitive SAF production (e.g., bolstering HEFA pathway) and feedstock development (e.g., abundant, 2nd generation cellulosic supply) will yield significant long-term returns as policy support strengthens and airline offtakes drive demand growth.

#### **BIOVERITAS**

#### Portfolio spotlight

The BioVeritas Process<sup>™</sup> represents a step-change forward in SAF production, delivering a cost-effective, lower carbon alternative that unlocks a wider range offeedstocks.

At the core of this innovation is Directed Mixed-Culture Fermentation, a proprietary process that converts locally available biomass into volatile fatty acids (VFAs). These VFAs are then refined through Low-Energy Acid Recovery (LEAR) and converted using commercially proven pathways to produce SAF with a dramatically improved carbon intensity profile.

By expanding feedstock availability and reducing process energy consumption, the BioVeritas Process<sup>™</sup> is uniquely positioned to scale alongside the aviation industry's ambitious SAF adoption. With unlimited growth potential, this breakthrough technology is setting a new standard for low-cost, high-impact decarbonization in aviation. INVESTMENT THEMES – INDUSTRIALS AND MANUF ACTURING

## Industrials and manufacturing

Decarbonization is a defining challenge for the industrials and manufacturing sector, requiring action to ensure competitiveness in a rapidly changing policy and economic landscape.

As industries worldwide face mounting pressure to reduce GHG emissions, the manufacturing sector must navigate a complex landscape of technological shifts, policy incentives, and economic realities.

Decarbonization efforts are increasing, but the pace and scale of adoption will depend on macroeconomic conditions, infrastructure readiness and plant economics.

How quickly these solutions scale will ultimately shape the industrial sector's ability to drive meaningful emissions reductions.

Deployment of key emerging solutions requires clarity in policy frameworks, investment in enabling infrastructure, and well-coordinated supply chains. We are particularly interested in:

**Carbon Capture, Utilization, and Storage (CCUS)**: a key enabler of industrial decarbonization, particularly for hard-to-abate sectors such as cement, steel, and chemicals.

**Industrial heat pumps:** a vital technology for decarbonizing industrial processes, especially in sectors reliant on low-to-medium temperature heat.



#### INVESTMENT THEMES – INDUSTRIALS AND MANUF ACTURING



The US leads the global pipeline, accounting for 58% of proposed capacity, followed by Europe and Canada.<sup>1</sup> Policy measures, including the 45Q carbon sequestration credits and European incentives, have helped spur investment.

>\$4.3<sub>BN</sub>

invested into CCUS projects globally in 2024 alone<sup>1</sup>

Despite its promise, CCUS faces notable challenges. The financial viability of projects is contingent on carbon pricing mechanisms, regulatory incentives, offtake agreements, and access to storage infrastructure. Bottlenecks in CO<sub>2</sub> transport and storage continue to pose hurdles, while public perception and complex permitting processes further complicate large-scale deployment.

Corporate decarbonization plans are increasingly driving demand for CCUS deployment. Addressing these challenges will be crucial for CCUS to fulfill its role as a cornerstone of industrial decarbonization.

#### Policy Spotlight: EU Clean Industrial Deal

The European Union's Clean Industrial Deal, introduced on February 26, 2025, seeks to maintain industrial competitiveness while advancing ambitious GHG emissions reduction goals.

With rising concerns over high energy costs and competition from the US and China, the plan outlines measures aimed at:

- > Mobilizing over €100BN to support EU-made clean manufacturing.
- Boosting deployment of renewables and demand for clean tech and products.
- > Circularity and access to raw materials, incl. 24% of materials circular by 2030 and demand aggregation for critical minerals.

Regulatory streamlining, including faster infrastructure permitting and updated regulatory frameworks for low-carbon technology, is a central component of the strategy. The European Investment Bank has pledged new funding guarantees to accelerate industrial decarbonization.

Some industry leaders remain concerned about Europe's long-term competitiveness, particularly as other countries strengthen their own industrial policies. Some warn that unless further action is taken, Europe risks increased reliance on imported raw materials from the US and China.

Geopolitical tensions–including the new US Administration's reversal on US climate policies and the potential for tariff-driven trade uncertainties–are raising further market uncertainty.<sup>2</sup>

The proposed Clean Industrial Deal is a significant step forward on competitiveness and decarbonization. The implementation of specific measures will depend on the broader EU's strategic defense and trade agenda.

## Carbon Capture, Utilization, and Storage

CCUS is increasingly recognized as a key technology in decarbonizing the industrial economy. Global carbon capture capacity is projected to grow eightfold by 2035, potentially reaching 410M metric tonnes of  $CO_2$  per year.

However, the pace of deployment is slowing due to financial and regulatory uncertainties, with only 52% of planned capacity currently considered likely to come online.

#### INVESTMENT THEMES – INDUSTRIALS AND MANUF ACTURING



The global demand for industrial heat below 200°C reached 5.9K TWh in 2022, with over 75% of this energy still derived from fossil fuels.<sup>3</sup>

#### Industrial heat pumps

Heat pumps can reuse waste heat from industrial processes, making them highly efficient and lowering overall emissions and costs. By leveraging waste heat and improving efficiency, industrial heat pumps present a viable pathway to reducing emissions while lowering operational costs, for industries including food and beverage, pulp and paper, and chemicals.

While the industrial heat pump market declined in 2024 after record investments during the pandemic, the market for industrial heat pumps is expected to grow again, driven by decarbonization mandates, advances in technology, and carbon pricing mechanisms. As manufacturing scales up, these systems are becoming more cost-competitive, especially when integrated with waste heat recovery. However, adoption remains constrained by high upfront costs, regulatory delays, and supply chain limitations.

Standardization of industrial heat pump designs has the potential to drive down costs and accelerate adoption across various industries. Additionally, government incentives–including upfront cost subsidies and carbon pricing mechanisms–can significantly improve the payback period for industrial heat pump investments, but the extent of federal support in the US remains uncertain under the current administration.

Beyond financial feasibility, supply chain readiness remains a key challenge. The availability of compressors, heat exchangers, and refrigerants is critical to large-scale deployment, while regulatory hurdles regarding grid connections continue to slow adoption.

The development of clear permitting processes and infrastructure support for industrial heat pump integration will be vital in ensuring widespread adoption. As industries seek cost-effective alternatives to fossil fuel-based heating, industrial heat pumps are positioned to play a key role in the transition to a lower-carbon manufacturing sector.



● INVESTMENT THEMES – FOOD AND AGRICULTURE

## Food and agriculture

The agricultural sector is at a pivotal moment, balancing the twin challenges of feeding a growing global population while mitigating the risks posed by water scarcity and a changing climate.

Despite a gradual decline in farmland acreage, the US remains one of the world's largest agricultural exporters, with an annual sector growth of 2–3%. Agriculture accounts for 10.5% of total US employment and is projected to reach \$1.4TN in gross production value–equivalent to 5.5% of total GDP–driven by productivity gains, technological advancements, and global demand.<sup>1</sup>

At the same time, the sector accounts for 12% of total US GHG emissions.

Changes in climate and water scarcity pose risks to agriculture's long-term growth, challenging the industry to balance increased productivity with sustainability. Ara sees significant investment opportunities where emerging technologies and practices can make agriculture both more productive and more sustainable:

**Technology and decarbonization in agriculture:** Creating new efficiencies and reducing environmental impact through advances in precision agriculture and sustainable fertilizers.

**Renewable energy and waste-to-fuel solutions:** Developing and adopting sustainable technologies and fuels across waste disposal, food processing, and transportation.

**Shifting trends:** Evolving regulatory frameworks signaling a shift in global food production and encouraging more sustainable practices.



#### INVESTMENTTHEMES – FOOD AND AGRICULTURE



## Technology and decarbonization in agriculture

Advancements in AI, robotics, and automation are increasing agricultural efficiency while reducing emissions related to soil management, urea fertilization, and fuel combustion. Precision farming technologies such as GPS mapping, sensors, drones, and big data analytics are optimizing field-level management, leading to higher productivity with lower resource intensity. Ammonia remains an essential input for global food production, with 80% of the world's ammonia supply (~152M tonnes) used in fertilizers.<sup>2</sup> However, its production is highly carbon-intensive. In the US, the adoption of blue ammonia–produced using Carbon Capture and Storage (CCS)–is expanding, supported by 45Q carbon sequestration credits and access to low-cost natural gas.

80%

of the world's ammonia supply is used for agricultural applications<sup>2</sup>

In contrast, Europe is positioning itself as a leader in green ammonia, benefitting from a strong emissions trading scheme and regulatory incentives to expand production.

Blue and Green Ammonia projects are capital intensive, and customer appetite to pay a premium for a lower-carbon solution may decline in the face of a potential global economic slowdown tied to trade disruptions. These headwinds may slow down or delay many blue and green hydrogen projects in the EU and US, especially if the latter rolls back 45V green hydrogen incentives. The EPA estimates that expanding anaerobic digesters could cut methane emissions by 2.2M metric tonnes annually.<sup>1</sup>

**Renewable energy and** 

waste-to-fuel solutions

are proving to be an effective solution.

Renewable energy is playing an increasingly

important role in agricultural decarbonization.

Anaerobic digesters, which break down organic

waste such as manure from dairy and swine farms,

The adoption of biofuels and other low-carbon fuels in food processing and transportation is also gaining traction as part of the broader energy transition.

## Shifting trends in agricultural practices

No-till farming, which reduces soil disturbance, enhances carbon sequestration, water retention, and fuel efficiency, can cut 137M metric tonnes  $CO_2e$  annually.

## 19%

reduction in total agricultural emissions from notilling farming<sup>1</sup>

Similarly, Integrated Nutrient Management (INM) is improving soil health by leveraging cover cropping, compost application, crop rotation, and efficient irrigation. These techniques have been shown to boost crop yields, enhance soil fertility, and improve water-use efficiency, further reducing reliance on carbon intensive synthetic fertilizers.<sup>2</sup>

#### ● INVESTMENTTHEMES – POWER

## Power

## The US power sector has a generational investment opportunity to modernize, expand, and decarbonize.

Reducing the sector's reliance on fossil fuels while ensuring grid stability is a significant challenge.

The rapid growth of Al-powered data centers, transportation electrification, and industrial demand is straining grid infrastructure, requiring investment in transmission expansion, demand-side flexibility, and balancing resources.

While new renewable capacity and grid modernization will play critical roles, legacy thermal power assets also remain essential in the energy transition for grid stability today and must be actively managed to minimize GHG and air emissions. Ara identifies three priority areas to address the root causes of industrial power sector emissions:

- > Optimizing thermal power generation: Providing a complementary path to near-term emissions reductions, alongside new clean energy infrastructure, while maintaining system reliability.
- > **Modernizing the grid**: Meeting the growing demand for energy across the US and enabling renewable integration.
- Energy storage and flexible generation: Accelerating investments in distributed systems and microgrids to reduce pressure on centralized infrastructure and enhance system resilience.



#### INVESTMENTTHEMES – POWER



## Optimizing thermal power generation

As the US power sector transitions toward a lowercarbon future, thermal power generation remains a critical part of the energy system. While the longterm objective is to scale cleaner, renewable energy solutions, thermal assets continue to provide essential reliability, especially amid accelerating demand growth from AI-driven data centers, electrification, and industrial expansion.

Reducing emissions from these assets in the near term offers a meaningful climate benefit. A ton of  $CO_2$  abated today has more cumulative impact than a ton avoided a decade from now. That makes optimizing existing thermal plants—through efficiency upgrades, carbon capture, and co-firing with lower-carbon fuels—an important part of a balanced decarbonization strategy.

#### Modernizing the grid

Infrastructure limitations are a growing bottleneck. The US electric grid spans more than 642K miles of high-voltage transmission lines, yet only 55 miles of new high-voltage lines were added in 2023.<sup>1,2</sup> Permitting constraints, supply chain shortages, and financing challenges further complicate efforts to modernize the grid and integrate increasing shares of intermittent renewable generation.

\$**7**™

in capital investment required by 2050 for grid expansion alone<sup>3</sup>

As grid modernization growing pains are overcome, considering CCUS as a decarbonization lever for legacy power plants can reduce the total cost of expanding the energy grid. Previous IEA analysis estimated that if the availability of  $CO_2$  storage in the power sector were restricted globally, future marginal abatement costs in the power sector would increase by up to 80%.<sup>4</sup> Renewables are growing rapidly, with solar and wind expected to expand from 41% of US electricity generation in 2024 to 45% by 2026.<sup>5</sup>

Integrating intermittent energy sources into a grid originally designed for centralized fossil fuel generation will require unprecedented capital investment.

Transmission expansion is particularly urgent, as renewable generation is often located far from demand centers, necessitating large-scale infrastructure buildout.

In addition to transmission, grid congestion is a significant bottleneck. Many regions are already experiencing delays in connecting new renewable power projects due to insufficient grid capacity.<sup>3</sup>

Advanced grid technologies—such as HVDC lines, dynamic line ratings, and grid-forming inverters could help alleviate some of these challenges, but adoption remains slow and capital-intensive.



<sup>1</sup> US. DOE, "Advanced Transmission Technologies - Department of Energy," 2020. <sup>2</sup> Utility Dive, "55Miles of High-Voltage Transmission Lines Added in 2023 as US BuildoutSlows: Report," 2024. <sup>3</sup> BCG, "Delivering the Energy Transition Will Come Down to the Wires," 2025. <sup>4</sup> IEA, "How carbon capture technologies support the power transition", 2020. <sup>a</sup> US. Energy Information Administration, "ShortTerm Energy Outlook," 2025.

#### ● INVESTMENT THEMES - POWER



## Energy storage and flexible generation

One of the primary challenges in decarbonizing the electric grid is intermittency of renewable energy.

Current energy storage deployments are insufficient to support deep renewable penetration, highlighting the need for expanded grid-scale storage, demand-side flexibility, and rapid-response backup generation.



the installed megawatt capacity of solar or wind is required to provide equivalent reliability as a typical gas-fired power plant, including pairing with large-scale battery energy storage systems (BESS)<sup>3</sup>

Investment in flexible generation and grid-balancing solutions is also critical. The shift toward more decentralized energy systems, microgrids, and virtual power plants could help reduce the strain on the centralized grid while improving resilience.<sup>3</sup>

#### Regulatory spotlight

The future of US power sector decarbonization will be shaped by shifting regulatory policies and investment priorities.

While the IRA has provided strong incentives for renewable energy and storage deployment, rollbacks in federal support under the current US Administration could place more emphasis on state-led regulatory and legislative actions, such as cap-andtrade programs and grid modernization efforts.

The financial landscape for power investment is also changing. Investment is flowing into grid upgrades, distributed energy resources, and energy storage, but the pace of deployment must accelerate to keep up with rising electricity demand.<sup>3</sup>



● INVESTMENT THEMES - INFRASTRUCTURE

## Infrastructure

The global infrastructure landscape is being shaped by energy volatility, aging assets, and the growing imperative to decarbonize the entire economy—not just the power sector.

Traditional centralized systems are straining under new demands—from AI to electrified transport prompting a growing pivot to distributed and midscale energy infrastructure.

In Europe, the geopolitical urgency to replace Russian energy has catalyzed record public and private investment—most notably in biomethane, waste-to-energy, and electrification. The REPowerEU plan targets 35 bcm of biomethane production by 2030, a nearly tenfold increase from current levels. With over €25BN in private capital required to be mobilized for new biomethane plants by 2030, the sector is scaling fast.<sup>1</sup>

Biomethane's utility across hard-to-electrify sectors—such as heavy-duty road transport and district heating—makes it an indispensable tool in Europe's decarbonization roadmap. As these use cases diversify, biogenic CO<sub>2</sub> by-products, from biogas upgrading, are also emerging as key feedstocks for longer-term solutions like SAF and e-fuels.<sup>2</sup>

Across North America, mid-market infrastructure represents a compelling investment opportunity. Less crowded and more fragmented, it offers multiple levers for value creation, smaller capex profiles, and meaningful decarbonization outcomes.

Ara Infrastructure is well-positioned to capitalize on these market shifts. We are deploying strategic capital into critical infrastructure assets that align with these macroeconomic trends, with a specific focus on four macro themes:

- > Energy demand growth.
- > National energy security.
- > Declining landfill capacity and waste disposal costs.
- > Onshoring of supply chains.







#### **Energy demand growth**

Europe and North America are grappling with aging energy infrastructure and surging demand. The growing deployment of AI-driven data centers and industrial electrification is compounding stress on grid capacity and reliability. In parallel, distributed energy solutions—such as behind-the-meter generation and energy hubs—are becoming increasingly relevant in light of grid congestion and delays.<sup>3</sup>

Ara Infrastructure targets mid-market infrastructure opportunities that respond to this bottleneck focusing on scalable distributed energy, low-carbon generation, and assets that can serve as local energy anchors. X

forecasted investment in the energy transition compared to fossil fuels in 2024<sup>4</sup>

#### National energy security

The global energy crisis triggered by Russia's invasion of Ukraine underscored the fragility of international energy markets. Immediate price shocks have stabilized, but recent escalations in the Middle East and attacks in the Red Sea serve as potent reminders of geopolitical volatility. These events are accelerating the reshoring of critical industries and bolstering government support for domestic energy production.

Germany's €500BN infrastructure reform plan—its most ambitious in decades—demonstrates the scale of capital being mobilized toward energy security and resilience.<sup>5</sup> Ara Infrastructure focuses on smaller, strategic energy assets—including low-carbon fuels and distributed infrastructure—that deliver reliability close to the point of use. Biomethane is a key pillar of this strategy. Ara emphasizes platforms with strong fundamentals: access to reliable feedstock, proven upgrading technology, and long-term gas offtake. End-use applications are split between transport and generation. Transport—particularly long-haul, heavyduty vehicles—represents a high-potential offtake segment given the challenges of electrifying these fleets. This segment alone accounts for roughly a quarter of all road transport CO<sub>2</sub> emissions, with more than 6.5M long-haul, heavy-duty vehicles in circulation across the EU and UK.<sup>6</sup>

## 2**0**×

emissions intensity of long-haul, heavy-duty vehicles compared to passenger vehicles<sup>6</sup>

Biomethane also plays a growing role in decarbonizing residential and commercial heat through grid injection, acting as a substitute for natural gas. Germany and the Netherlands illustrate divergent but complementary models—one focused on transport, the other on district heating. Emerging use cases include biogenic  $CO_2$  capture for SAF and e-fuels production.



37

#### ● INVESTMENT THEMES - INFRASTRUCTURE



#### Rapidly declining landfill capacity and waste disposal costs

Municipal landfill share has decreased by 26% in Europe over the past decade, and approximately 50% in the US since the 1960s.<sup>7,8</sup> Landfill capacity in both North America and Europe has continued to decrease driven by policy reforms, environmental concerns, recycling efforts and limited land availability; however, total waste generation continues to rise.



decline in US landfills from 1988 to 2017<sup>9</sup>

Stringent regulations in the US have made it very challenging to obtain new landfill permits, resulting in high upfront costs and, consequently, higher waste disposal costs. Latest estimates by Solid Waste Environmental Excellence Protocol (SWEEP) suggest that there is only roughly 15 years of landfill capacity remaining in the US as of 2021.<sup>10</sup>

This is driving significant momentum behind wasteto-X infrastructure, particularly where offtake is secured through conversion into fuels or industrial products. Ara targets scalable, lower-capex projects that enable anaerobic digestion, gas upgrading, and bio-conversion into high-value outputs. These investments both divert waste from landfill and reduce carbon intensity in industrial processes.

#### **Onshoring of supply chains**

Supply chain disruption and global trade volatility have catalyzed a movement toward localization. In North America, reshoring is expanding demand for regional logistics hubs, energy infrastructure, and vertically integrated industrial capacity. Ara Infrastructure emphasizes investments that enable cost-effective decarbonization within manufacturing footprints—such as industrial energy efficiency and distributed power.

Solutions like waste heat recovery and process electrification can deliver rapid carbon reductions and provide financial resilience.

UP TO

€140<sub>BN</sub>

in global energy savings could be realized by capturing untapped industrial waste heat alone<sup>11</sup>

Electrification of heat—through heat pumps and high-efficiency systems—also plays a central role in Ara's mid-market decarbonization thesis.



## Appendix

APPENDIX

#### Glossary

**Scope 1** – As defined by the GHG Protocol, Scope 1 emissions are direct greenhouse (GHG) emissions that occur from sources that are controlled or owned by an organization (e.g., emissions associated with fuel combustion in boilers, furnaces, vehicles).

**Scope 2** – As defined by the GHG Protocol, Scope 2 emissions are indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling.

**Scope 3** – As defined by the GHG Protocol, Scope 3 emissions are the result of activities from assets not owned or controlled by the reporting organization, but that the organization indirectly impacts in its value chain.

**GHG emissions reduction** – metric ton(s) of carbon dioxide equivalent reduced, saved or avoided by business activity below the baseline emissions.

**Operational emissions** – Emissions directly associated with a company's operations (Scope 1 and 2).

**Value chain emissions** – Emissions from the upstream and downstream activities associated with the operations of the reporting company (Scope 3).

**Greenhouse Gas Protocol** – The Protocol was launched with the dual objective of developing an international standard for accounting and reporting related to greenhouse gas emissions by companies and disseminating this standard as widely as possible.

**Partnership for Carbon Accounting Financials (PCAF)** – A global partnership of financial institutions that work together to develop and implement a harmonized approach to assess and disclose the GHG emissions associated with their loans and investments.

**Product carbon footprint (PCF) study** – An analysis that sums up the total greenhouse gas emissions generated by a product over the different stages of its life cycle.

**Realized Emissions Reduction** – A decrease in greenhouse gas emissions that has been delivered and calculated based on historical data (a.k.a., actual emissions reduction).

**Waste Avoided** – Reduction of waste sent to landfill and/or incineration as a result of using circular input materials.

**Emissions Reduction Potential (ERP)** – A solution's ability to reduce greenhouse gas emissions over a specified time horizon compared to the use of its incumbent(s) in the status quo/ baseline scenario.

**Waste Reduction Potential (WRP)** – A solution's ability to reduce waste sent to standard disposal methods (primarily landfill and incineration) over a specified time horizon compared to the use of its incumbent(s) in the status quo/ baseline scenario.

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41



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