

# Arbos: Green Metal Recovery with Alyssum Mining

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## 1. Introduction: The Challenge of Industrial Pollution

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Industrial activities, while vital for economic growth, have often left a legacy of environmental contamination. Heavy metal pollution from factories, refineries, and mining operations poses severe risks to human health, damages ecosystems, and renders land and groundwater unusable. This devaluation of land not only represents a significant economic loss but also a persistent threat to environmental stability.



**What do you see?** - Severe health risks - Damaged ecosystem  
- Contaminated groundwater - Devaluation of land

Chemicals from factories polluting the soil and groundwater create a cascade of environmental and economic problems that traditional remediation methods struggle to address effectively.

## 2. The Solution: Alyssum Mining by Arbos

Arbos, with its "Soul for Soil" philosophy, introduces a revolutionary solution: **Alyssum Mining**. This innovative green technology leverages the power of nature to address industrial pollution. By using specific species of *Alyssum* plants, which are natural hyperaccumulators of heavy metals, Arbos can extract valuable metals like nickel directly from contaminated or low-grade soils.





## Alyssum plants (Hyperaccumulators)

### What Makes Alyssum Special?



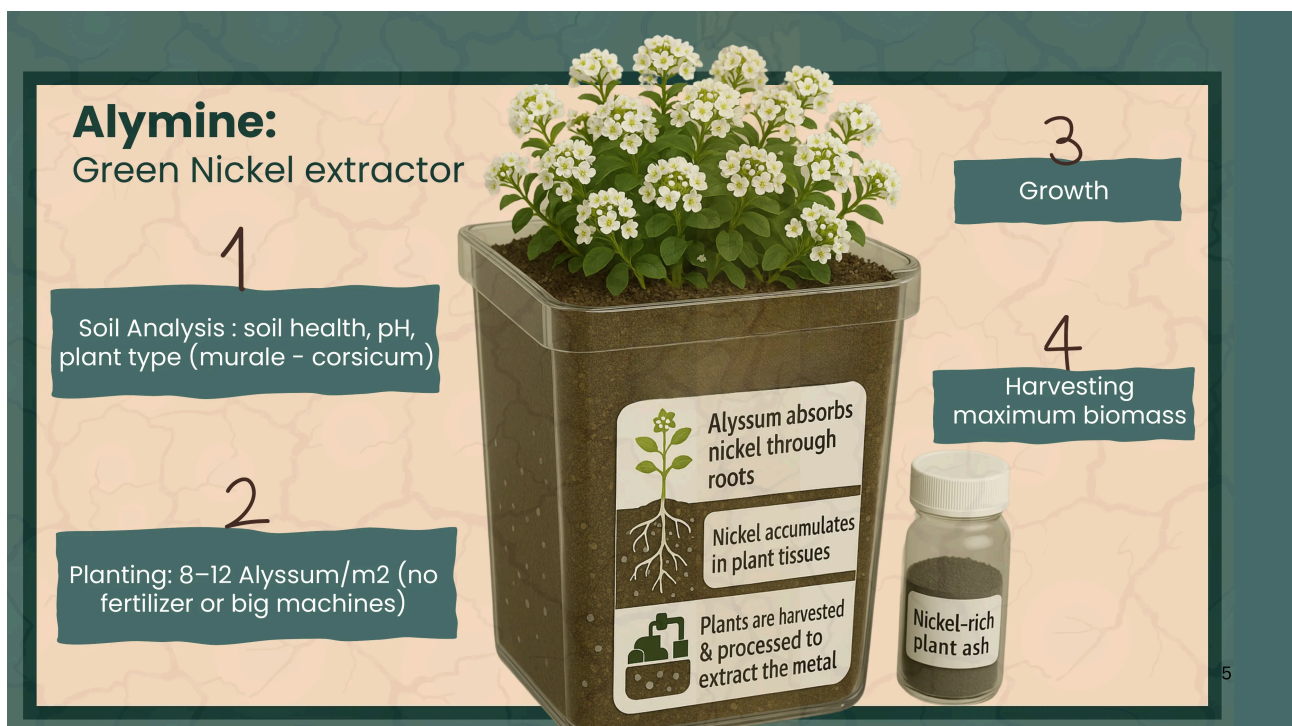
#### What Makes Alyssum Special?

- Transforms polluted land into fertile soil
- Absorbs up to 3% nickel (30,000 mg/kg) in leaves and stems
- Dual revenue streams with low capital investment
- High return potential
- Supports ESG goals: carbon credits, green tech certifications, and circular economy initiatives

- **Transforms polluted land into fertile soil:** These remarkable plants can rehabilitate contaminated areas
- **Absorbs up to 3% nickel (30,000 mg/kg)** in leaves and stems through natural hyperaccumulation

- **Dual revenue streams with low capital investment:** Generates income from both remediation and metal recovery
- **High return potential:** Offers attractive financial returns for investors and landowners
- **Supports ESG goals:** Enables carbon credits, green tech certifications, and circular economy initiatives

### 3. The Alymine Process: A Step-by-Step Guide



Arbos has developed a systematic process called **Alymine** to ensure efficient and effective green nickel extraction:

#### Step 1: Soil Analysis

- Assess soil health, pH levels, and metal concentrations
- Determine optimal plant type (murale vs corsicum species)
- Evaluate site conditions for maximum efficiency

#### Step 2: Planting

- Plant 8-12 Alyssum plants per square meter

- No fertilizer or heavy machinery required
- Minimal environmental disruption during installation

### **Step 3: Growth**

- Plants naturally absorb nickel through their root systems
- Alyssum absorbs nickel through roots and accumulates it in plant tissues
- Monitoring growth and metal accumulation levels

### **Step 4: Harvesting**

- Harvest at maximum biomass when nickel concentration peaks
- Plants are harvested and processed to extract the metal

### **Step 5: Processing**

- Nickel-rich plant ash is produced for metal extraction
- High-value nickel recovery for commercial use

## **4. Metal Extraction: From Biomass to Bricks**

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After harvesting, the nickel-rich biomass is processed in partnership with specialized facilities to recover the metal through a three-step process:

### **Step 1: Biomass Incineration**

- Dried plants are burned at 500–700°C
- Reduces biomass to concentrated metal-rich ash

### **Step 2: Nickel Extraction**

- Hydrometallurgical processes extract nickel from ash
- Up to 95% recovery efficiency achieved



### Step 3: Refining and Shaping

- Recovered nickel is refined into commercial-grade bricks
- Ready for sale to industrial markets

## 5. Business Model: Flexible and Profitable

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Arbos offers a flexible business model tailored to the specific conditions of each site, maximizing value for all stakeholders.

### 5.1. Standard Service (Nickel Yield < 200 kg/ha)

For sites with lower nickel concentrations, Arbos offers a comprehensive fixed-price remediation service:

- **Fixed Price:** €9,000 per hectare
- **Services Included:**
  - Comprehensive soil testing and analysis
  - Professional planting and plant care
  - Complete harvesting operations
  - Detailed ESG impact report
- **Financial Performance:**
  - Revenue: €9,000 per hectare
  - Costs: €5,200 per hectare
  - Gross Profit: €3,800 per hectare
- **Gross Profit Margin: 42%**
- Break-even point: 133 kg of nickel

### 5.2. Shared Revenue Model (Nickel Yield $\geq$ 200 kg/ha)

For sites with higher nickel yields, Arbos implements a shared revenue model that benefits all stakeholders:

- **Activation Trigger:** When nickel yield reaches 200 kg per hectare or more
- **Processing Partnership:** Biomass sent to specialized processing partner

- **Revenue Distribution:**
- 50% to processing partner (for extraction and refining)
- 50% to Alymine operations
- Of Alymine's share: 20% to landowner (client), 80% retained by Arbos

This model ensures that higher-value sites generate proportionally higher returns for both Arbos and the landowner.

## 6. Market and Customer Segments

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Arbos targets a diverse range of clients across three main categories:

### 6.1. Industrial Sites (B2B)

- Former factories requiring environmental remediation
- Decommissioned refineries with metal contamination
- Abandoned mining areas needing restoration
- Industrial facilities seeking ESG compliance

### 6.2. Landowners (B2C)

- Individual property owners with contaminated land
- Private entities seeking land value restoration
- Agricultural landowners with metal pollution issues
- Real estate developers requiring site preparation

### 6.3. Government & Public Institutions (B2G)

- Municipal authorities managing contaminated public land
- Environmental agencies overseeing remediation projects
- Public institutions with regulatory compliance requirements
- Government bodies promoting sustainable development

## 7. Key Partnerships and Ecosystem

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Arbos has established strategic partnerships across the value chain to ensure comprehensive service delivery:

### Metal Processing Partners

- **Eramet (France):** Leading nickel processing and refining
- **Nickel Mining Company (France):** Specialized metal extraction services

### Testing and Monitoring Partners

- **AGROLAB France SARL:** Comprehensive soil testing and analysis
- **SGS France:** International testing, inspection, and certification

### Government and Regulatory Partners

- **Municipalities:** Local government collaboration for public projects
- **Environmental Agencies:** Regulatory compliance and oversight support

### Seed and Agricultural Partners







- **Graines Voltz (France):** Specialized Alyssum seed supply
- **Muller Seeds (Netherlands):** Regional seed distribution and support

## 8. Competitive Advantage Analysis

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Alyssum Mining offers significant advantages over traditional remediation methods across multiple criteria:



Method	Avg. Cost/ha	Profitability	Timeline	Environmental Impact	Carbon Credit Eligibility	ESG Value
<b>Alyssum Mining</b>	€9k - €15k	High 	6-12 months	Very Positive 	High Potential	Very High
Excavation & Disposal	€20k - €25k	Low 	6-18 months	Disruptive & Costly	Not Eligible	Low
Chemical Soil Washing	€15k - €40k	Unprofitable 	3-6 months	Unsuitable for Reuse	Rarely Eligible	None
Bioremediation (Microbes)	€10k - €25k	Low 	3-19 years	Moderate 	Not Directly	Moderate

**Key Advantages of Alyssum Mining:** - **Most cost-effective** solution in the market - **Fastest timeline** for meaningful results - **Only method** that generates positive environmental impact - **Highest ESG value** for corporate sustainability goals - **Strong potential** for carbon credit generation

## 9. Marketing Strategy and Target Persona

### 9.1. Comprehensive Marketing Approach

**Government and NGO Engagement:** - Partner with environmental NGOs for contaminated land remediation advocacy - Collaborate with government agencies on public remediation projects

**Industry Outreach:** - Target companies in electric vehicle, battery, and renewable energy sectors - Participate in industry conferences and networking events

**Content and Education Marketing:** - Publish detailed case studies highlighting successful remediation projects - Create and distribute press kits to environmental and industry journalists - Organize workshops and masterclasses showcasing Alyssum Mining benefits - Host networking conferences with potential industrial partners

**Digital Presence:** - Develop comprehensive website with client testimonials and project documentation - Create visual and informative content for social media platforms - Maintain active presence on professional networks

## 9.2. Target Customer Persona: David Cole

**Demographics:** - **Name:** David Cole - **Age:** 55 years old - **Position:** CEO of Electric Car Company - **Location:** Germany - **Annual Income:** €100,000 - **Education:** Master's in Environmental Engineering

**Professional Interests:** - Passionate about sustainable automotive technologies - Active in professional networks and green automotive conferences - Focused on electric vehicle innovations and environmental compliance

**Goals and Motivations:** - **Regulatory Compliance:** Ensure electric vehicle operations meet strict environmental regulations - **Cost Optimization:** Find cost-effective methods, especially for battery production processes - **Brand Enhancement:** Adopt efficient production methods and minimize resource waste - **Sustainability Leadership:** Enhance company's green image and achieve ambitious sustainability goals

## 10. The Arbos Leadership Team

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Arbos is led by a dynamic team of seven dedicated professionals, each bringing specialized expertise to their respective departments:

- **Farah:** Chief Executive Officer - Strategic leadership and vision
- **Umai:** VP of Research & Development - Scientific innovation and technology development
- **Sophia:** Chief Operating Officer - Operational excellence and process optimization
- **Jana:** Chief Financial Officer - Financial strategy and performance management
- **Iulia:** VP of Business Development - Partnership development and market expansion
- **Aizirek:** Chief Technology Officer - Technical innovation and system development
- **Catalina:** Head of Marketing and Sales - Market positioning and customer acquisition

# 11. Financial Projections and Growth Strategy

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## 11.1. Short-Term Goals (1–2 years)

**Market Expansion:** €1M investment - Expand operations to 5 EU regions - Establish comprehensive market presence

**Infrastructure Development:** €1M investment

- Build dedicated planting and harvesting sites - Develop operational capacity for scale

**Research and Development:** €500K investment - Advanced soil and plant matching research - Optimization of extraction processes

## 11.2. Mid/Long-Term Goals (3–7 years)

**Industrial Infrastructure:** €1.5M investment - Develop dedicated nickel refining facility - Achieve vertical integration of the value chain

**Agricultural Program:** €350K investment - Launch comprehensive Alyssum seed program - Ensure sustainable supply chain

## 11.3. Projected Impact and Returns

**Operational Targets:** - **Land Remediation:** Clean over 1,000 hectares of polluted land - **Metal Production:** Produce over 200 tonnes of nickel annually - **Market Leadership:** Become the EU leader in green nickel production

**Financial Outlook:** - **Annual Revenue:** €3.7–4M per year at full capacity - **Break-even Timeline:** 1–2 years from major investment - **Long-term ROI:** 6–8x return over 10-year period

# 12. Environmental and Social Impact

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## 12.1. Environmental Benefits

**Land Transformation:** Converts polluted, unproductive land back into fertile, usable soil suitable for agriculture or development.



**Carbon Sequestration:** Alyssum plants capture and store carbon during their growth cycle, contributing to climate change mitigation efforts.

**Ecosystem Restoration:** Gradual restoration of damaged environments, supporting biodiversity recovery and ecological balance.

**Sustainable Mining:** Provides an environmentally friendly alternative to traditional destructive mining methods.

## 12.2. Social and Economic Impact

**Community Health:** Reduces health risks associated with heavy metal contamination in local communities.

**Economic Revitalization:** Transforms worthless contaminated land into valuable, productive assets.

**Job Creation:** Generates employment opportunities in environmental restoration and green technology sectors.

**Knowledge Transfer:** Develops expertise and best practices that can be applied globally to similar environmental challenges.

## Conclusion

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Arbos represents a paradigm shift in environmental remediation, transforming the traditional cost-center approach to contamination cleanup into a profitable, sustainable business model. Through the innovative Alyssum Mining process, we are not just cleaning up the planet—we are creating a new industry at the intersection of biotechnology, environmental restoration, and sustainable resource recovery.

Our approach demonstrates that environmental responsibility and economic viability are not mutually exclusive but can be synergistic forces driving innovation and positive change. As we scale our operations across Europe and beyond, Arbos is positioned to become a leader in the emerging green economy, proving that nature-based solutions can address some of our most pressing environmental challenges while generating sustainable returns for all stakeholders.

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*This documentation represents the comprehensive integration of Arbos's business strategy with detailed visual elements and enhanced information from their presentation*

*materials, providing a complete overview of their revolutionary Alyssum Mining technology and market approach.*