

## Swedish Bio-coal for Steel Industry

#### **Biocarbon in the Nordics**



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# **BIVÍJAS**

#### **Business Strategy**

- Mitigate climate change
- Provide high-quality C from bio-resources from forestry residues
- Targetting the metallurgical industry in the Nordic countries, ca. > 350 000 ton annually by 2026
- Direct & indirect sales through selected partners
- Build-own-operate
- Turn-key delivery

# PAVATAS

#### Process

- Dry biomass is heated to

   600 °C in an inert atmosphere during <30</li>
   min to evaporate all volatiles.
- Mass balance is ~22-25% carbon, ~25% oil and syngas
- 2 lines x auger reactor for production heated) +small test facility for R&D
- In-depth know-how in HighQ bio-carbon production (>90% fixed carbon content)
- Up to 250 kg/h bio-carbon per line →2000 tpy/line/annually



### We produce unique HighQ bio-carbon

90-95% Carbon Content

<3% Volatile Matters

<1.5% **Ash Content** 

Ash Content (S and P free)

#### 33-35 MJ/kg



## High Bulk Density

>500 **kg**/m<sup>3</sup>

## Safe delivery

## **Renewable pyrolysis oil**



- Heating value 16-20 MJ
- **Moisture** ~15-30%
- pH ~2,5
- Density (20°C) ~1200 kg/m3
- High levels of oxygen
- Issues with solids



#### **Growing operation**

- Testbed in operation since January 2019
- Shipments to potential customers for test purposes
- Commissioning and upscaling of production to 50 ton a week
- Potential growth with existing system upto 5.000 ton/a C.
- More plant to be built  $\rightarrow$  50.000 ton by 2026







ÐĨ	<b>Visit Technology</b>	<b>Technology's Evaluation Criteria</b>		
Weight	Feature			
1.0	Reliability = minimized downtime			
0.93	Robustness = feedstock flexibility			
0.93	Durability = Service & Maintenance→ Trustful suppliers & contractors	<ul> <li>Lower risk</li> <li>Lower product price</li> <li>Higher profit</li> </ul>	<ul> <li>Lower risk</li> <li>Lower product price</li> <li>Higher profit</li> <li>Reliable targets</li> <li>Industrial significance</li> </ul>	
0.87	Efficiency = Integrated use of energy	<ul> <li>Reliable targets</li> <li>Industrial significance</li> </ul>		
0.8	Product quality = high temp required	CAPEX • Step to fossil-free steel • Use of proofed		
0.73	Scaling potential	technologies		
0.67	Complexity = less is better		9	



#### Summary

- Different products of bio-carbon are needed but demand drives the supply
- Time
- Technology
- Resources & logistics
- Competence
- Capital





# We need to unite our forces to make those changes happen



## Thank you 😊

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