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International Biomass Torrefaction and Carbonisation Council

Bulk Terminals Marseille 2025, 29th of October

IBTC International Biomass Torrefaction and Carbonisation Council

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International Biomass
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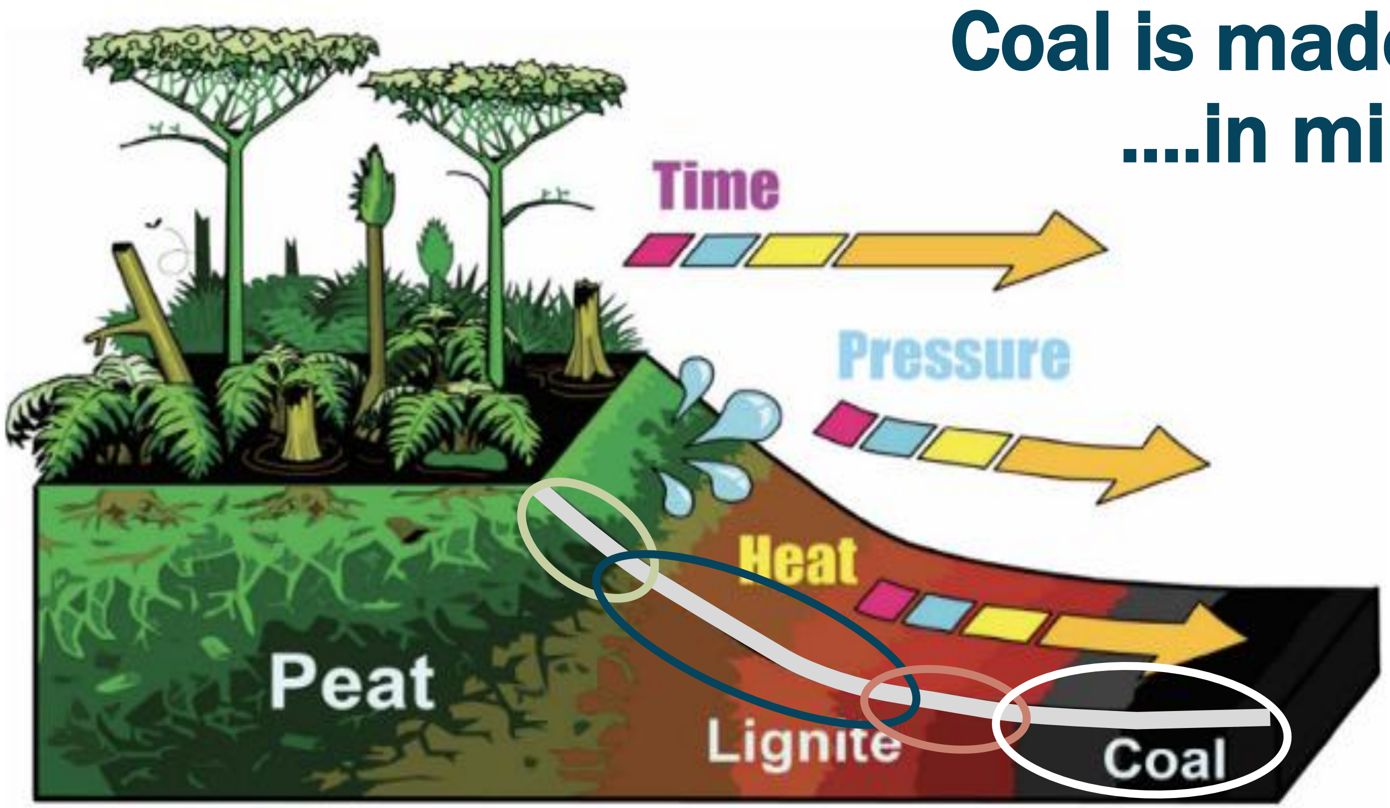
What we do with and for our members

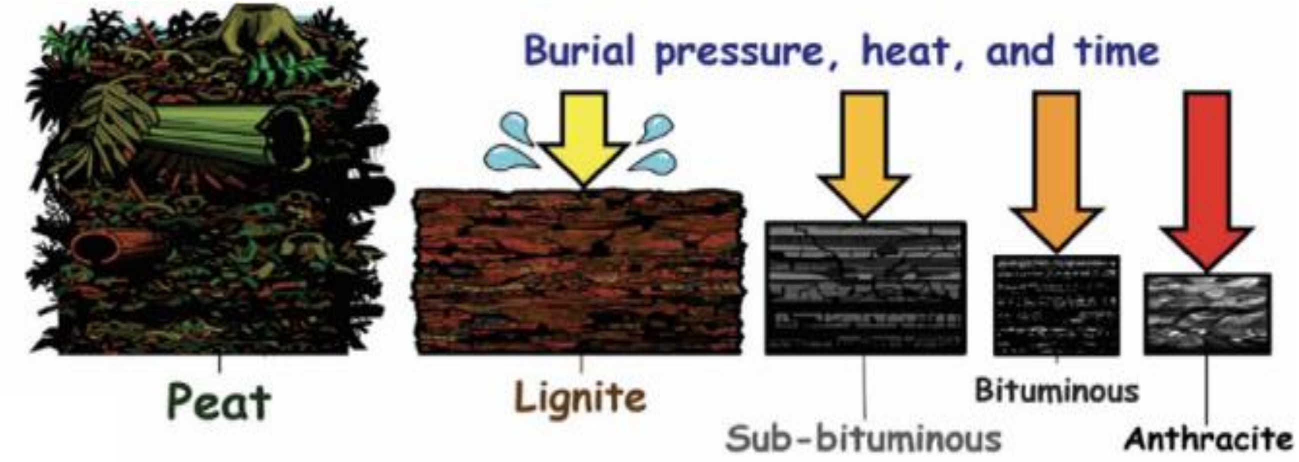
- → Market promotion and networking
- → Initiating ISO standards and development c
  commoditization products
- → Master permits and certification for handling, logistics and trade
- → Bridging science to industry
- → Member networking
- → Statistics and market analytics

Processes and Products

Coal is made of biomass
....in million of years



Today 100million 3 - 400million



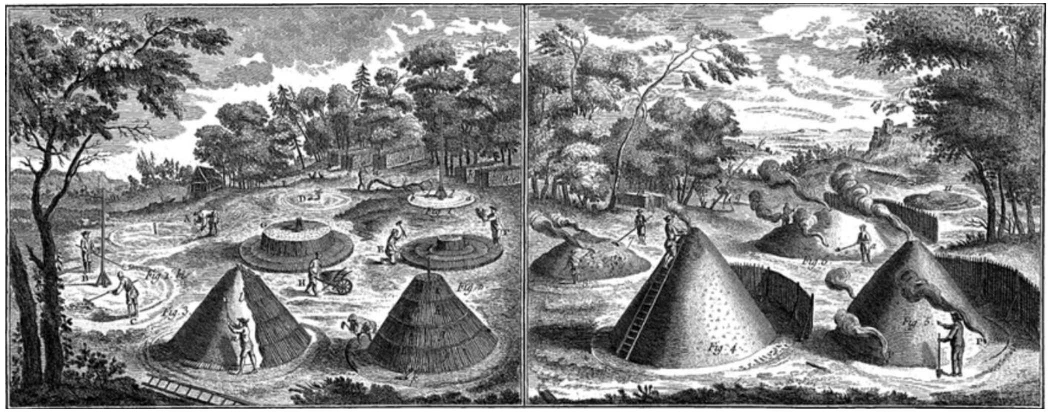
	GCV kJ/kg	GCV kcal/kg
	17000	4057
Steam Explosion		
	21000	5012
Torrefaction		
	25000	5967
Pyrolyses		
	29000	6921
Carbonisation = Charring		
	33000	7876

...or within minutes

by technology and temperature

6000 years of proven market success
- the product remains but production turns lossless

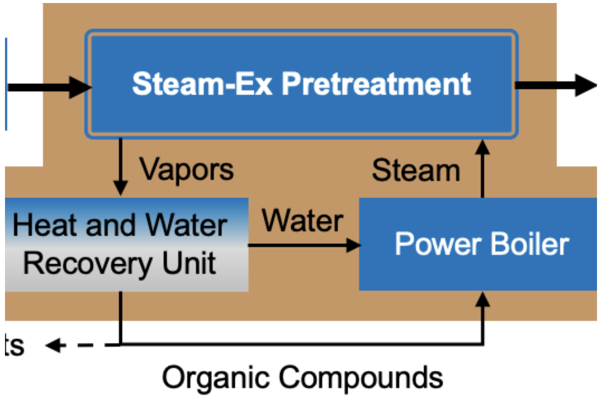
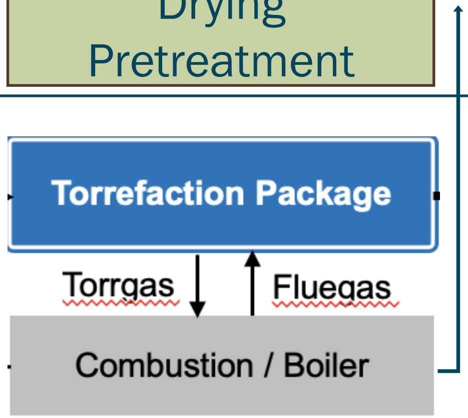
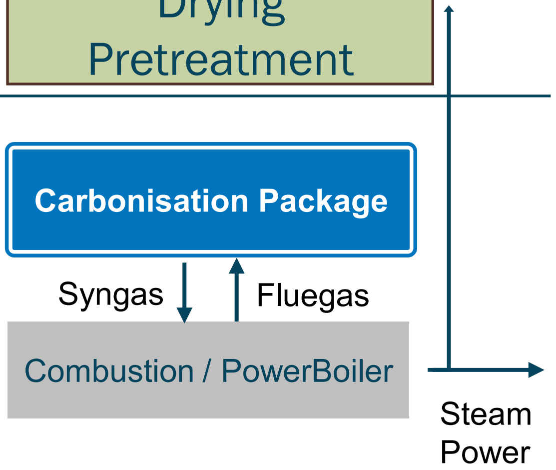
Traditional batch process 20 days



Continuous process 1-60 minutes

In traditional kilns 80% of the mass from feedstock is lost.

Modern Torrefaction/Carbonisation Technology is using every bit of energy fed into the process and optimizes M&E balance. Total and unavoidable losses <10%

	Steam Explosion	Torrefaction	Carbonisation
COMMON FIRST STEPS	Sizing Drying Pretreatment	Sizing Drying Pretreatment	Sizing Drying Pretreatment
SPECIFIC PROCESS			
TYPICAL LINE SIZE	4-20t/h	4-20t/h	4-20t/h
TYPICAL PRODUCTS AND FORM FACTOR (NOT LIMITED!!)	Fuels pellets, Furfural  Pellets* 6 - 12 mm	Fuel  Piston or Extrusion Briquetted 40 - 100mm	Carbon, Syngas Power, Cooling  Roller Briquetted 12 - 50mm
TYPICAL USAGE	Power plant	Power plant, Steel mills PCI, Biointermediary	Power plant, Metallurgical Carbon, Base for AC

* HTC – Hydrothermal Carbonization a potential future industrial scale technology

Typical Product Form Factors for Trading

Pellets*
6 - 12 mm

Piston or Extrusion Briquetted
40 - 100mm

Agglomerated

Roller Briquetted
12 - 50mm

Terminology according to ISO working group (ISO TC 238 WG1):

Pyrogenic Biocarbon, the term for Biocarbon utilized in energy or for processes;
Biochar, the term used for Biocarbon that is sequestered

*__Black pellets__ from steam explosion - **Biocarbon pellets/briquettes** from thermal processes

Biocarbon vs Coal: Parameters Reference

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CIRCULAR BIOCARBON							
Standard	Wood Pellet ISO 17225-2	Steam Exploded Pellet ISO 17225-8	Torrefied Biomass Pellets/Briquett ISO 17225-8	Steamcoal	Bio-Carbon Pellets/Briquettes ISO WG	Metcoal	Biochar undensified WBC cert
Moisture content (% wt)	7–10	3 – 8	2–8	10 - 12	3–8	10 - 12	30% rec
Ash Content (% wt)	0.3–1.5	0.3–3	1,5-5	1 - 10	1,5–8	<10	14 max
Calorific value NCV (MJ /kg)	16–17	19-21	19–23	20-25	25–32	27 - 31	
Volatiles (% db)	70–75	70	50–60	30 - 43	10–25	20 - 28	
Fixed carbon (% db)	20–25	20–25	25–50	37 - 49	60–95	50 - 60	>70
Bulk density (kg /m³)	650–680	700-750	650–700	700 - 1100	650–750	830–950	150–350
Energy density (GJ/m³)	10,4–11	15-16	13–17	15 - 21	18,2–24	22 - 28	
Dust	Average	Low	Average	Low	Low/Average	Low	High
Hydroscopic properties	Hydrophilic	Hydrophobic	Hydrophobic	Hydrophobic	Hydrophobic	Hydrophobic	
Biological degradation	Yes	slow	very low	very low	No	very low	No
Milling requirements	Classic/special	HGI 40–45	HGI 40–50	HGI 40 - 50	HGI 45–55	HGI 50 +	
Handling properties	Special/dry	Easy	Easy	Easy	Easy	Easy	with care
Transport costs	Average	Low	Low	Low	Low	Low	high
EPA PAH							6 g t-1 db
EFSA PAH							1 g t-1 db
PCB							0,2mg/kg db
H/Corg							< 0,7(< 0,4) db

Summarizing the Differences

BIOCOAL

Replacing fossil coal for heat generation and gasification

BIOCHAR

A sustainable solution for carbon sequestration

BIOCARBON

Decarbonizing the metallurgical industry

	BIOCOAL	BIOCHAR	BIOCARBON
Fix C%	20-25%	70%	80-85+%
NCV (MJ/Kg) dry basis	19-20	N.A.	25-30+

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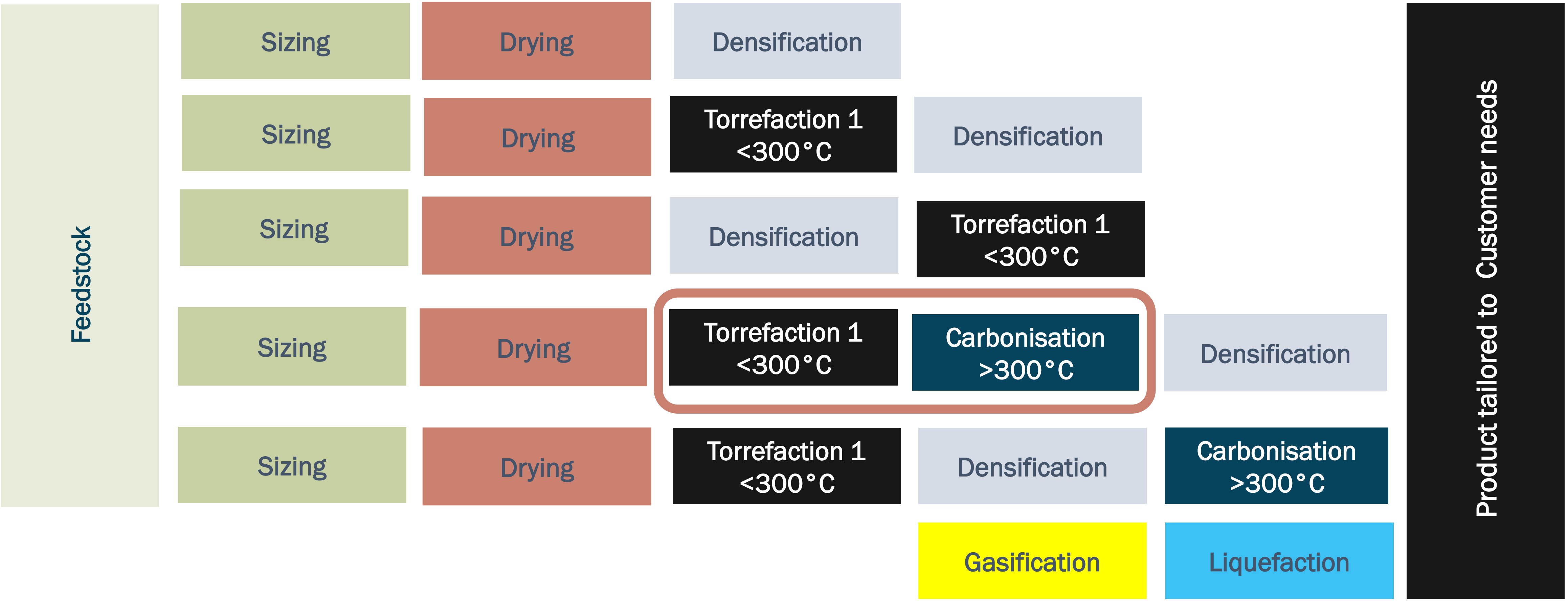
Lining up process steps in a biocarbon value chain

Basically, the value chain is built of up to 5 steps from gate of first processing installation to final delivered product. While it seems logic that first 3 steps are unavoidably located at place of feedstock origin it may be worthwhile analyzing if location of final steps at place of consumption provide advantages.



Challenges in shipping of Pyrogenic Biocarbon

Regulatory development challenges the transport of Biocarbon under IMO regulation

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In a critical regulatory shift, the IMO has issued an amendment to the IMSBC Code, classifying carbon of animal or vegetable origin as dangerous goods, coming into force on January 1, 2026.

Under Amendment 42-24 to the IMDG Code, key changes include the removal of SP925 and SP223 from column 6 of the Dangerous Goods List for CARBON, animal or vegetable origin UN 1361, and the addition of the new SP978. This new special provision imposes stringent requirements ***, including disqualification from the UN N.4 self-heating exemption*** *, mandatory weathering periods for unpackaged cargo, headroom requirements in CTUs, a 1.5m maximum stowage height, and a temperature cap at the time of packing. For CARBON, ACTIVATED UN 1362, SP925 and SP223 are similarly replaced by SP979, which stipulates conditions under which steam- or chemically activated carbon may be exempt from most Code provisions.*

Source:

https://www.gov.uk/government/publications/min-715-m-cargoes-amendments-to-the-imsbc-code-07-23-and-imdg-code-42-24/min-715-m-carriage-of-cargoes-adoption-of-amendment-07-23-of-the-international-maritime-solid-bulk-cargoes-imsbc-code-and-amendment-42-24-of-the

What now?

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- The amendment, poses a direct threat to the growth trajectory of pyrogenic biocarbon as an emergent commodity class.
- **BUT** the reason for this IMO decision lies in shipments that actually have nothing to do with Biocarbon for energy or industrial use, but **mainly result from accidents involving shisha charcoal,** which was itself often incorrectly declared.

- **We understand that steam exploded and torrefied products are NOT under the Amendment 42-24!**
- Developing a deeper understanding of safety criteria in production and testing, as well as defining standards is essential;
- and collaboration is needed to resolve uncertainties!

The Role of the IBTC

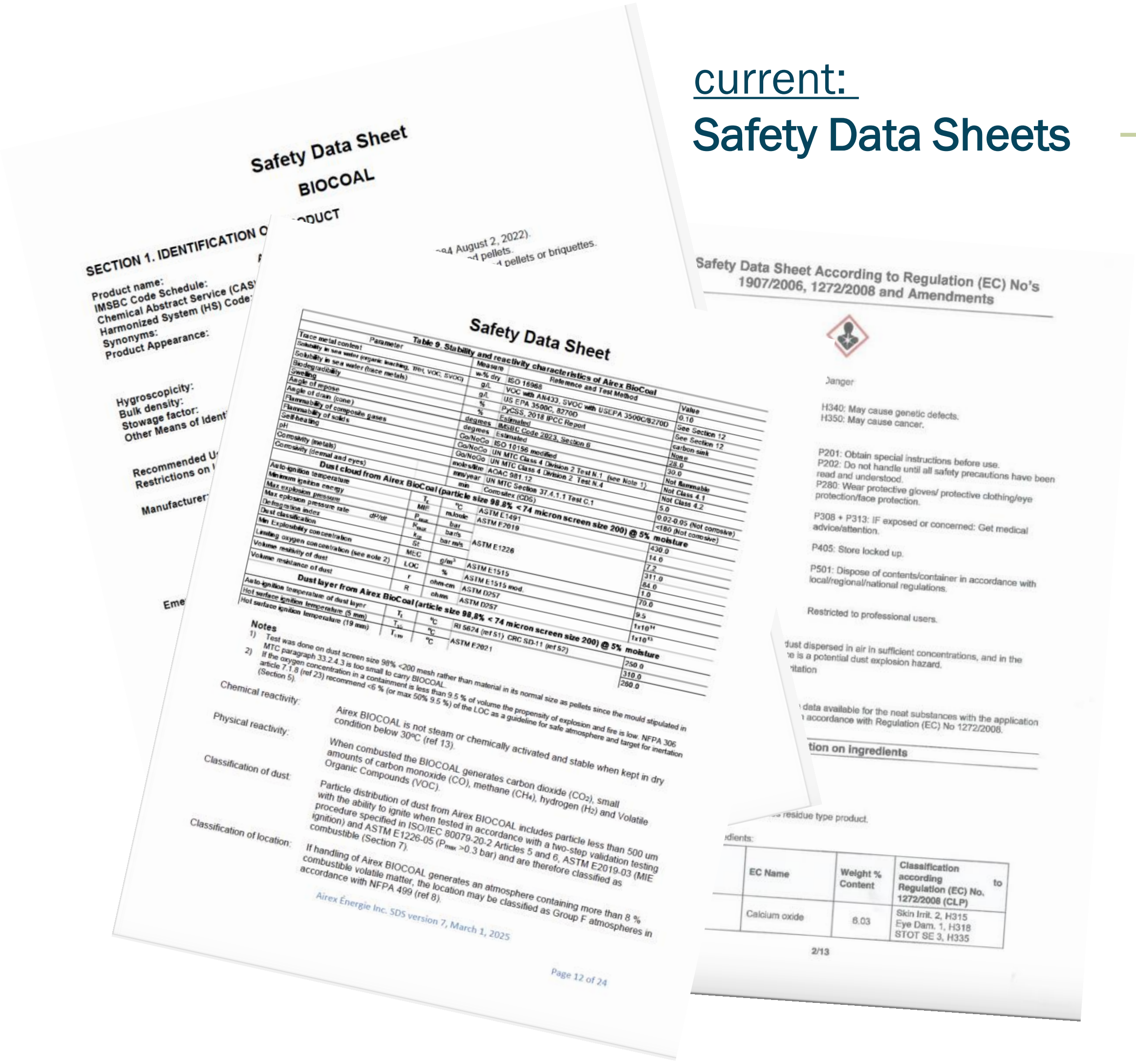
IBTC

- Recognizing the urgency, the IBTC launched the "IMO Working Group" in December 2024 and assembled a Taskforce to work in direct collaboration with relevant authorities.
- Supporting the development of a new IMSBC code for biocarbon that allows for **the continued legal, safe, and economically viable transport of the material at scale. But this will take years…**
- Looking for short term solutions in collaboration with all parties along the value chain.

The IBTC formally invites all companies and institutions active across the Circular Biocarbon value chain to join this initiative!

Stakeholder participation is essential to co-create a sustainable and regulation-compliant future for Biocarbon logistics.

Way forward...



current:
Safety Data Sheets

transitional / short term:
develop a standard format / manual for navigating for **tripartite agreements**

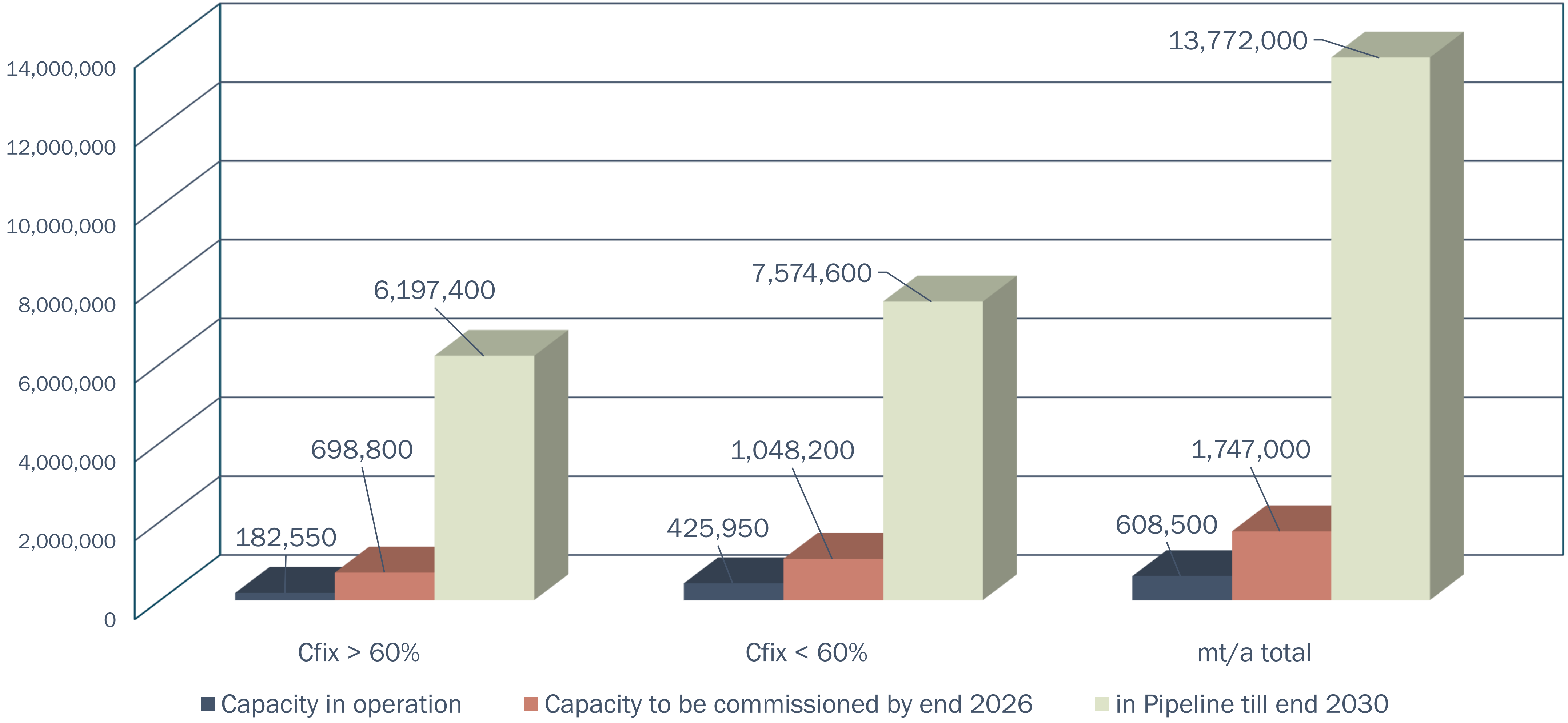
mid term:
create a data-driven case to **re-classify Biocoal** as non-dangerous under the IMSBC code, applying for re-coding of the existing IMSBC code for torrefied biomass (incl. steam exploded)

long term:
new IMSBC code for Biocarbon

Production Capacity – operating & outlook

Capacity outlook mt/a

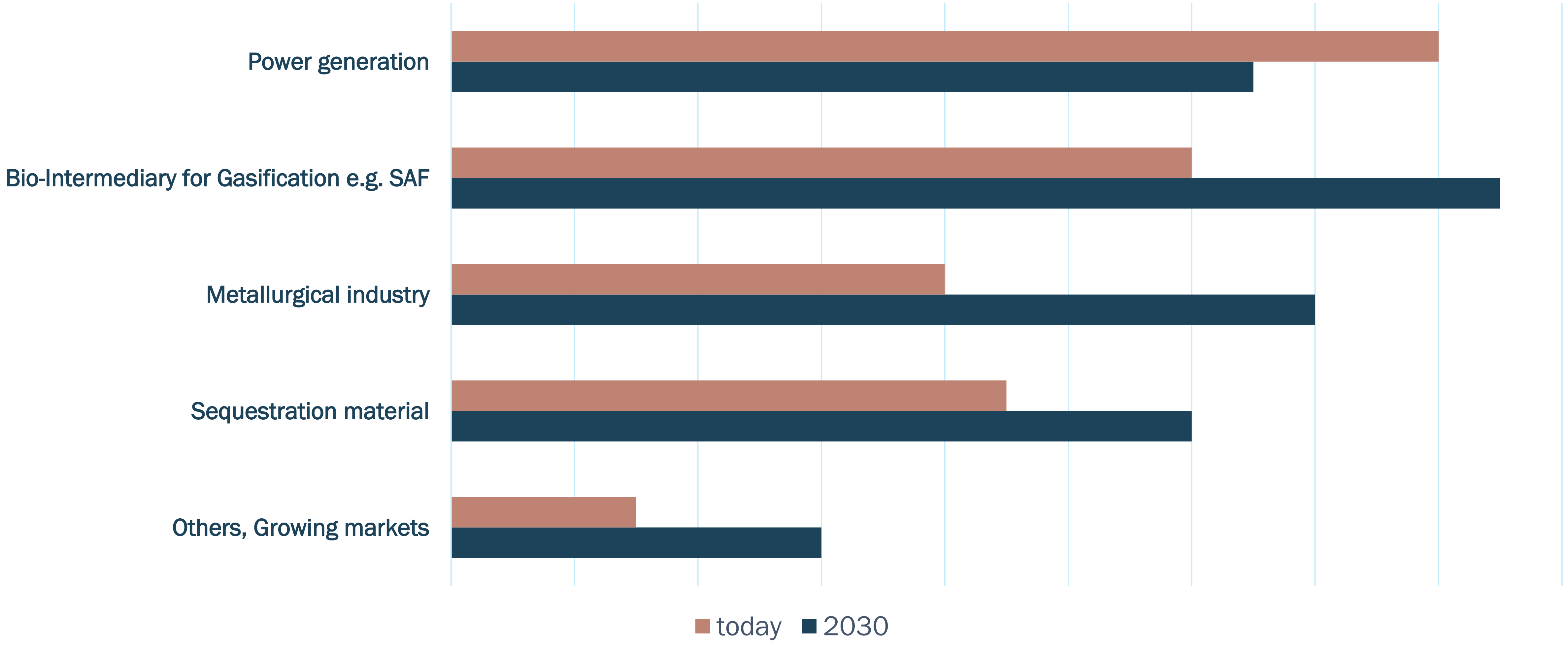
Capacity in operation, commissioned by end of 2026, in pipeline till 2030



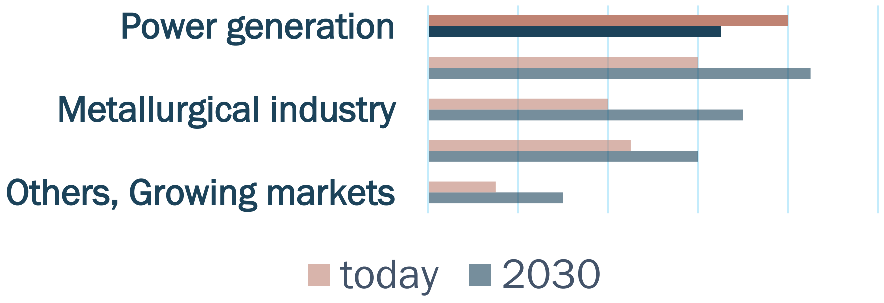
Data from IBTC members survey 2025.

Which applications drive the volumes globally

trends as seen by producers and suppliers



Data from IBTC members survey 2025.



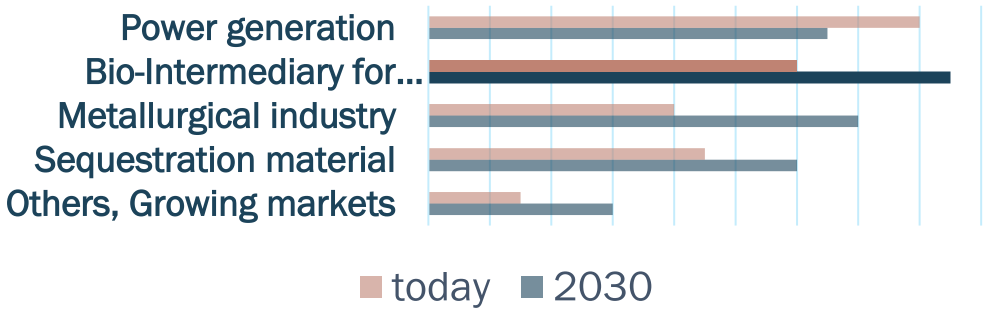
Co-firing Biocoal in coal power plants

selected examples of potential Japanese consumers

Cfix < 60%

JAPAN POWER STATION	Prefecture	Fuel	Present	When Available
Haramachi Thermal Power Station		Coal	biomass	
Hekinan	Aichi	Coal		biomass
Hitachinaka (常陸那珂火力発電所)	Ibaraki	Coal		biomass
Ishikawa	Okinawa	Coal		biomass
Kashima	Ibaraki	Coal		biomass
Kin	Okinawa	Coal		biomass
Maizuru (舞鶴発電所)	Kyoto	Coal	biomass	-
Matsuura	Saga	Coal		biomass
Misumi	Shimane	Coal		biomass
Nagoya Power Plant		Coal	biomass	
Naie (奈井江発電所)	Hokkaido	Coal		biomass
Nakoso	Fukushima	Coal	biomass	
Nanao Ohta Power Station		Coal	biomass	
Nanao-Ohta	Ishikawa	Coal	biomass	-
Niihamanishi (新居浜西火力発電所)	Ehime	Coal		biomass
Oozaki Power Station		Coal	biomass	
Reihoku (苓北発電所)	Kumamoto	Coal		biomass
Sakata	Yamagata	Coal	biomass	-
Sendai	Miyagi	Coal		biomass
Shin-Onoda Power Station		Coal	biomass	
Shinchi Thermal Power Station		Coal	biomass	
Sunagawa (砂川発電所)	Hokkaido	Coal		biomass
Taketoyo Thermal Power Station		Coal	biomass	
Tomato Atsuma	Hokkaido	Coal		biomass

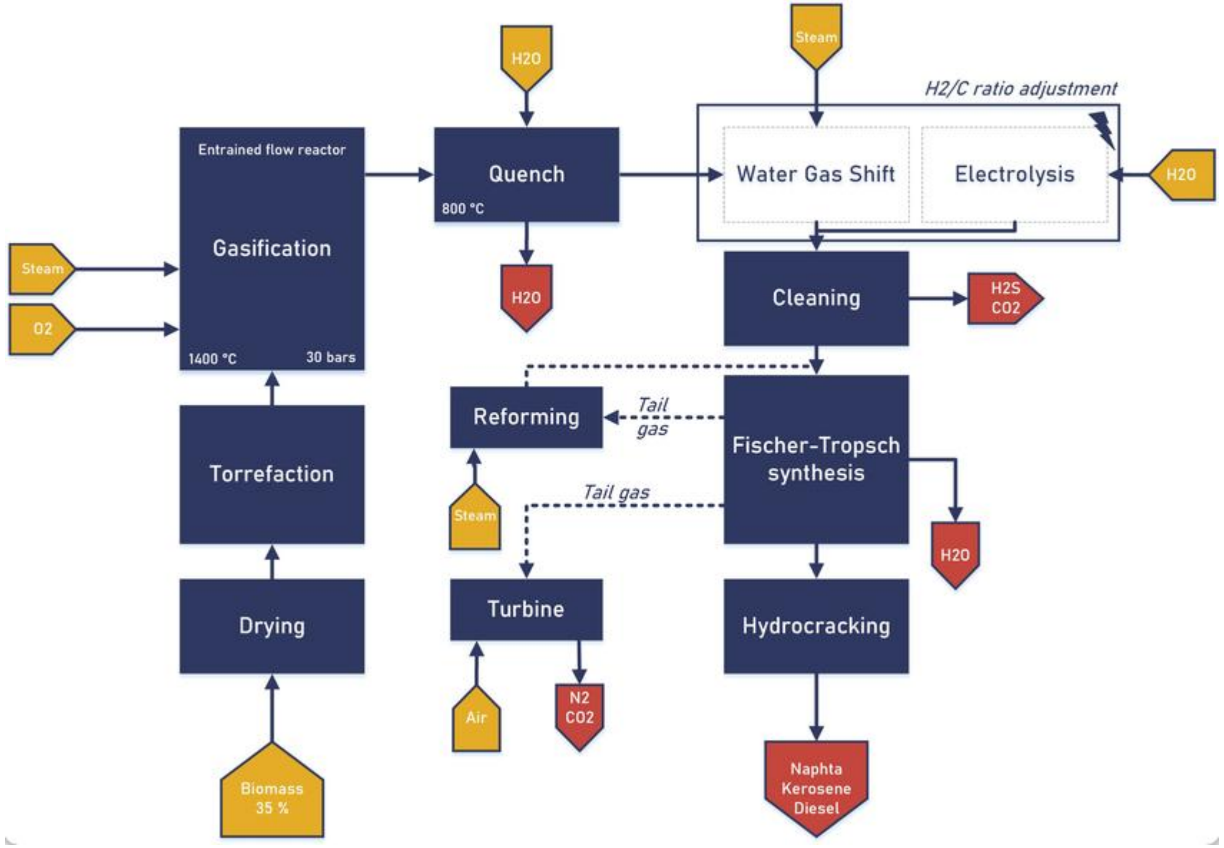
RWE The energy to lead
NUON VATTENFALL
GDF SUEZ ECN



Biointermediary - Commoditisation

Feedstock for several processes

Gasification The torrefied biomass is gasified and converted into synthesis gas with significantly higher efficiency than raw biomass (a mixture of H2, CO, and other gases).



TORREFACTION INCREASE SAF,DME, Hydrogen, Ammonia, Biomethanol PRODUCTION EFFICENCY

Improved Feedstock Properties:

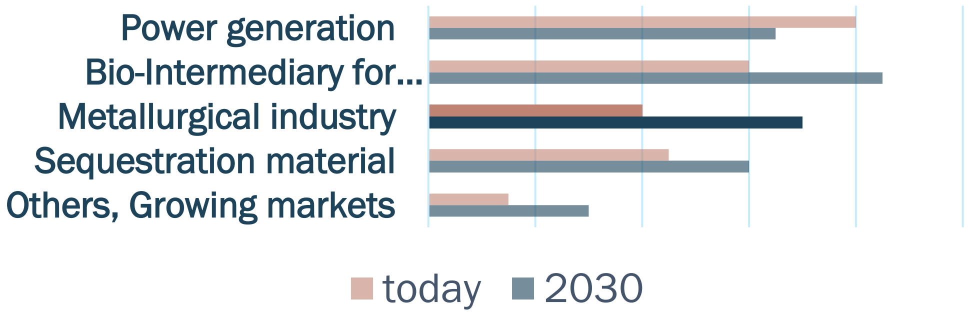
Torrefied biomass is the best suitable feedstock for gasification and other thermochemical conversion processes.

Low moister, very homogeneous, high energy density:

Low cost transport/storage, best LCA, homogeneous product from different pre-processors, more energy per m3 delivered, Increased catchment area for feedstock

Economies of scale:

This allows for economies of scale in FT or other end product processes



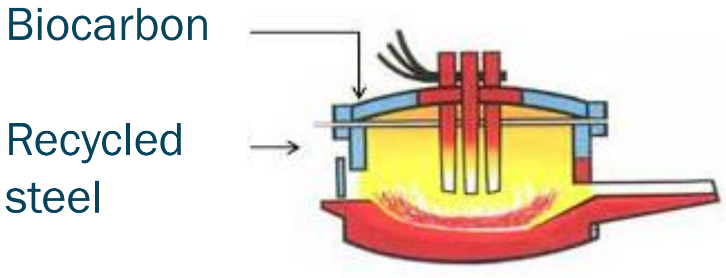
Metallurgical industry

Defossilisation in different application

Cfix < 60% & > 60%

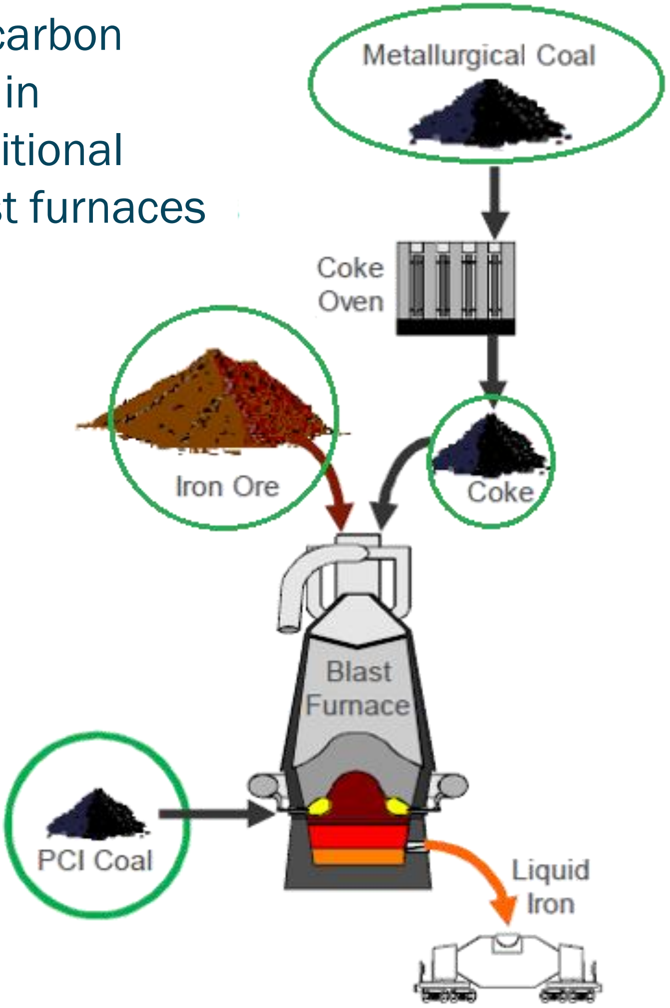
Some metallurgical sector companies active in	Biocarbon procurement and consumption
Arcelor Mital	Voest
Outokumpu	SSAB
Tata Steel	Eramet
Nucor	Vale
Nippon Steel	Tecnored
Thyssen Krupp	Elkem
Rio Tinto	Steel Dynamics

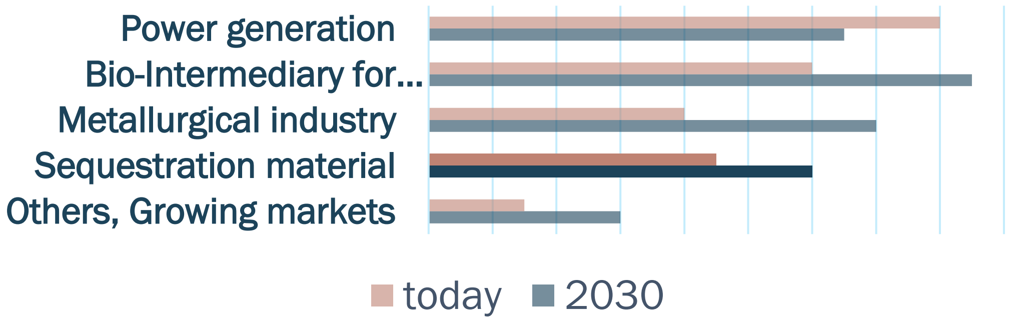
EAF furnaces



Biocarbon has the potential to play an important role in decarbonising the metallurgical industry in a wide range of applications as e.g. PCI, reductant material, coke replacement.

Biocarbon use in traditional blast furnaces





Sequestration

Carbon negative solutions

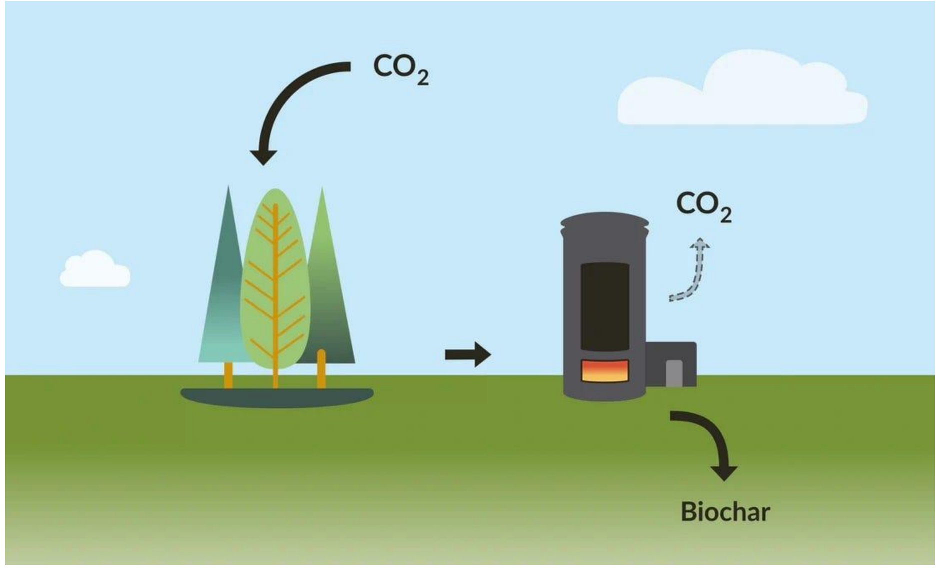
Cfix > 60%, H/C_{org}< 0,7

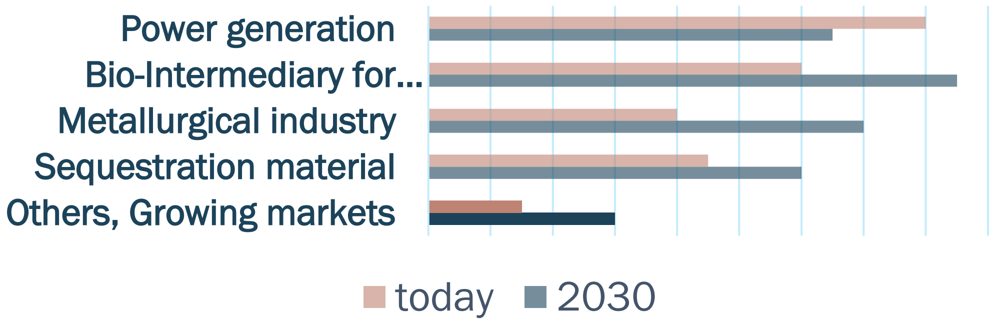
1. Capture
   Plants take in CO_2 from the atmosphere.

2. Feedstock
   Biomass, like wood chips typically used as fuel or left to decompose, is gathered.

3. Stabilization
   Through pyrolysis, biomass is transformed into biochar, which locks carbon in a form that resists breaking down.

4. Storage
   Biochar is applied back to the soil to enhance its fertility or incorporated into a matrix for carbon sequestration.





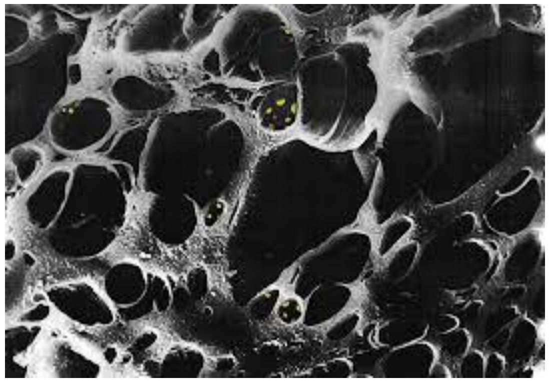
Niche markets growing fast

Technology on TRL 8 with numerous “niche” markets, significant value proposition and enormous potential

Graphite for battery anodes (biomass into anode-grade graphite) – replacing traditional fossil-based Carbon.

Process material / feedstock (reductant, plastics fillers, carbon black etc)

Activated carbon (eg. for the pharmaceutical industry, animal feed, water cleaning, AC)



Terminology & Specifications

Quality – Standardisation

ISO 17225 Solid biofuels – Fuel specifications and classes

ISO TS 17225 - 8: Graded thermally treated and densified biomass fuels

Different Feedstock and Classes

1. Wood biomass different classes
2. Herbaceous biomass
3. Fruit biomass
4. Aquatic biomass

Net Calorific Value, Durability, Bulk Density, Volatile Matter, Water sorption, Grindability etc.

ISO TC 238 „Solid Biofuels and Pyrogenic Biocarbon" is currently tensly inworking on the development of a Standard or Technical Specification for Pyrogenic Biocarbon to cover all products of Carbonization processes

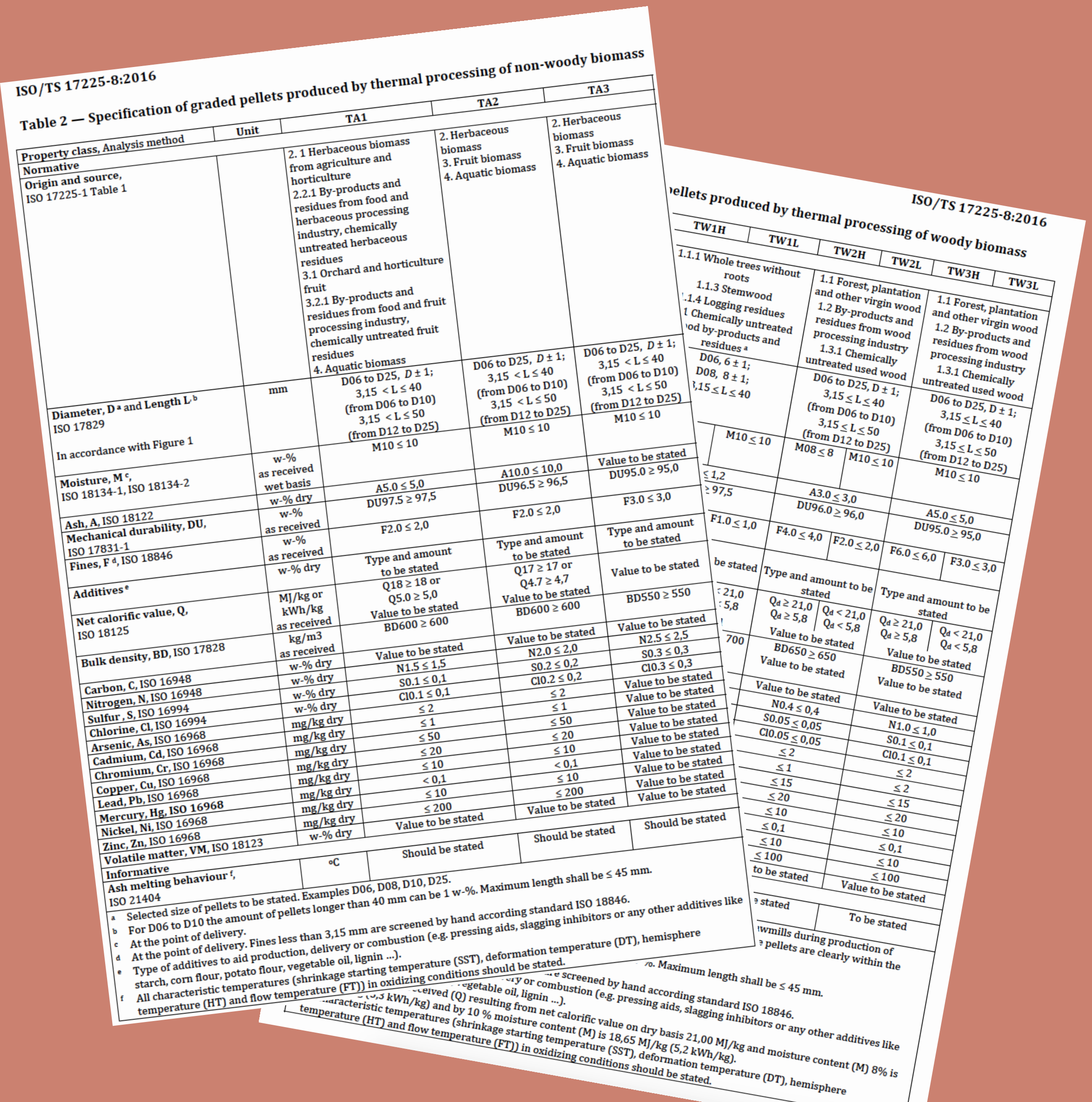

ISO/TS 17225-8:2016

Table 2 — Specification of graded pellets produced by thermal processing of non-woody biomass

Property class, Analysis method	Unit	TA1	TA2	TA3
Normative				
Origin and source, ISO 17225-1 Table 1		2.1 Herbaceous biomass from agriculture and horticulture 2.2.1 By-products and residues from food and herbaceous processing industry, chemically untreated herbaceous residues 3.1 Orchard and horticulture fruit 3.2.1 By-products and residues from food and fruit processing industry, chemically untreated fruit residues 4. Aquatic biomass	2. Herbaceous biomass 3. Fruit biomass 4. Aquatic biomass	2. Herbaceous biomass 3. Fruit biomass 4. Aquatic biomass
Diameter, D [a] and Length L [b] ISO 17829 In accordance with Figure 1	mm	D06 to D25, D ± 1; 3,15 < L ≤ 40 (from D06 to D10) 3,15 < L ≤ 50 (from D12 to D25)	D06 to D25, D ± 1; 3,15 < L ≤ 40 (from D06 to D10) 3,15 < L ≤ 50 (from D12 to D25)	D06 to D25, D ± 1; 3,15 < L ≤ 40 (from D06 to D10) 3,15 < L ≤ 50 (from D12 to D25)
Moisture, M [c], ISO 18134-1, ISO 18134-2	w-% as received wet basis	M10 ≤ 10	M10 ≤ 10	M10 ≤ 10
Ash, A, ISO 18122	w-% dry	A5.0 ≤ 5,0	A10.0 ≤ 10,0	Value to be stated
Mechanical durability, DU, ISO 17831-1	w-% as received	DU97.5 ≥ 97,5	DU96.5 ≥ 96,5	DU95.0 ≥ 95,0
Fines, F [d], ISO 18846	w-% as received	F2.0 ≤ 2,0	F2.0 ≤ 2,0	F3.0 ≤ 3,0
Additives [e]	w-% dry	Type and amount to be stated	Type and amount to be stated	Type and amount to be stated
Net calorific value, Q, ISO 18125	MJ/kg or kWh/kg as received	Q18 ≥ 18 or Q5.0 ≥ 5,0 Value to be stated	Q17 ≥ 17 or Q4.7 ≥ 4,7 Value to be stated	Value to be stated
Bulk density, BD, ISO 17828	kg/m3 as received	BD600 ≥ 600	BD600 ≥ 600	BD550 ≥ 550
Carbon, C, ISO 16948	w-% dry	Value to be stated	Value to be stated	Value to be stated
Nitrogen, N, ISO 16948	w-% dry	N1.5 ≤ 1,5	N2.0 ≤ 2,0	N2.5 ≤ 2,5
Sulfur, S, ISO 16994	w-% dry	S0.1 ≤ 0,1	S0.2 ≤ 0,2	S0.3 ≤ 0,3
Chlorine, Cl, ISO 16994	w-% dry	Cl0.1 ≤ 0,1	Cl0.2 ≤ 0,2	Cl0.3 ≤ 0,3
Arsenic, As, ISO 16968	mg/kg dry	≤ 2	≤ 2	Value to be stated
Cadmium, Cd, ISO 16968	mg/kg dry	≤ 1	≤ 1	Value to be stated
Chromium, Cr, ISO 16968	mg/kg dry	≤ 50	≤ 50	Value to be stated
Copper, Cu, ISO 16968	mg/kg dry	≤ 20	≤ 20	Value to be stated
Lead, Pb, ISO 16968	mg/kg dry	≤ 10	≤ 10	Value to be stated
Mercury, Hg, ISO 16968	mg/kg dry	< 0,1	< 0,1	Value to be stated
Nickel, Ni, ISO 16968	mg/kg dry	≤ 10	≤ 10	Value to be stated
Zinc, Zn, ISO 16968	mg/kg dry	≤ 200	≤ 200	Value to be stated
Volatile matter, VM, ISO 18123	w-% dry	Value to be stated	Value to be stated	Value to be stated
Informative				
Ash melting behaviour [f], ISO 21404	°C	Should be stated	Should be stated	Should be stated

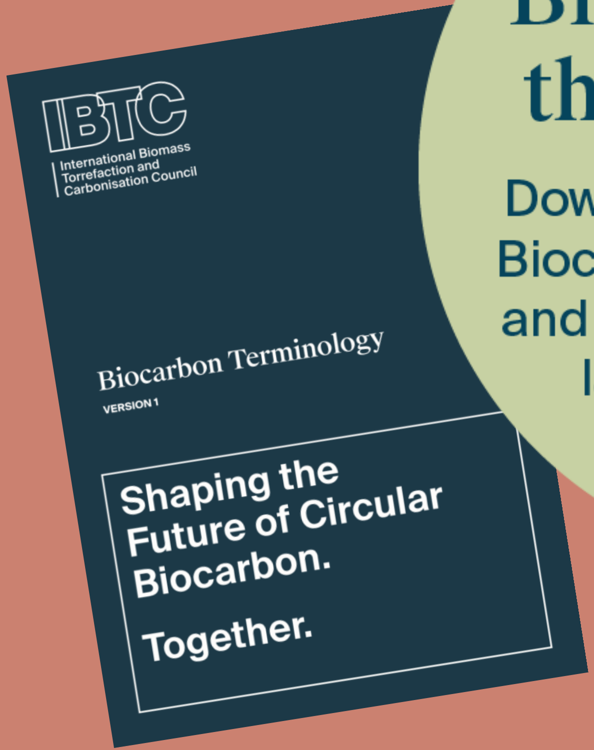
a Selected size of pellets to be stated. Examples D06, D08, D10, D25.
b For D06 to D10 the amount of pellets longer than 40 mm can be 1 w-%. Maximum length shall be ≤ 45 mm.
c At the point of delivery.
d At the point of delivery. Fines less than 3,15 mm are screened by hand according standard ISO 18846.
e Type of additives to aid production, delivery or combustion (e.g. pressing aids, slagging inhibitors or any other additives like starch, corn flour, potato flour, vegetable oil, lignin ...).
f All characteristic temperatures (shrinkage starting temperature (SST), deformation temperature (DT), hemisphere temperature (HT) and flow temperature (FT)) in oxidizing conditions should be stated.

Biocarbon Terminology

We have realized the big confusion in the field of processes and products in thermal upgrading of biomass and do want to offer a first attempt to provide a comprehensive list of definitions and delimitations synthesizing what we see as current understanding in the market.

The glossary will be updated regularly.

Get your free copy here:
https://www.ibtc-council.org/biocarbonterminology



Biochar or Biocoal? What's the difference?

Download your free copy of Biocarbon Terminology now and stay up to date with the latest industry terms and definitions!

Circular Biocarbon

An umbrella term proposed by IBTC: Circular biocarbon can be used as a generic term for all biomass-derived carbon products produced and utilized in a circular way from plant biomass.

By the term may seem to be redundant at first glance, we propose the word “circular” not only to represent the carbon cycle that is closed in the short term when biomass is used, by absorbing the carbon released into the atmosphere by the next generation of plants through photosynthesis (dark reaction), but also **to illustrate the clear focus to follow the principles of the circular economy**. These include sustainable sourcing, sustainable and efficient processing, using all components of the resource, avoiding waste streams, with a focus on **optimizing environmental, social, material and economic values achieved through the use of innovative practices and technologies**.

Therefore the designation of a material as "circular biocarbon" is a clear extension of of the term "pyrogenic biocarbon" used in the standards and confirms that this meets the compliance criteria of a regenerative circular economy.

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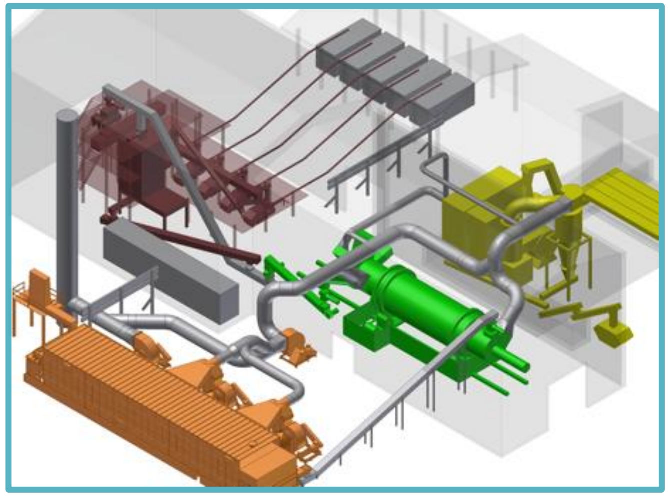
A 6000 - year success story, continued…

…but NOT in such unsustainable way!

Optimizing the Mass- and Energy Balance at minimized material and energy waste –

The precondition for successful implementation




Examples on implemented production lines

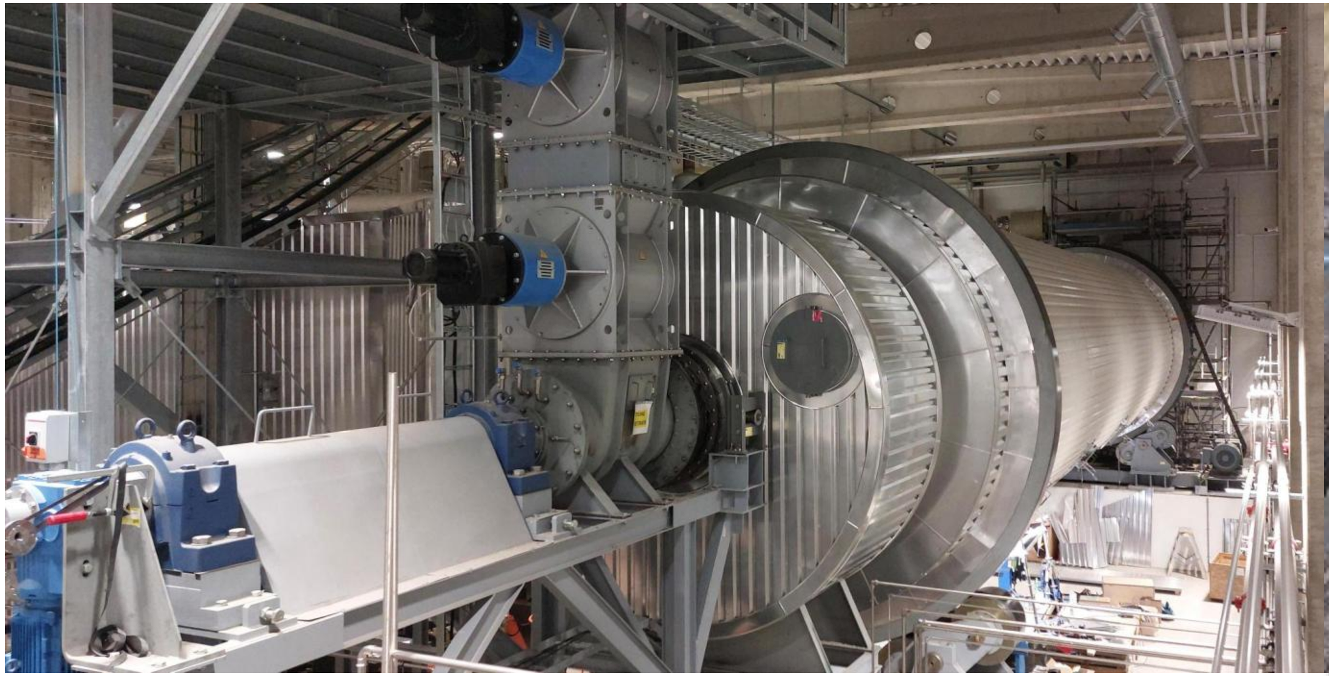
Selected Industrial Scale Biomass Plants – Joensuu Finland

Largest Biocoal plant in Europe started operation in Q1/25
Plant transitioned from cold into hot commissioning while finalization work continued in parallel in Q1.
From Q2continuous production of a Biocoal briquette for power and the metallurgical industry.
Capacity 60.000mt Biocoal per year made from forestry residues.

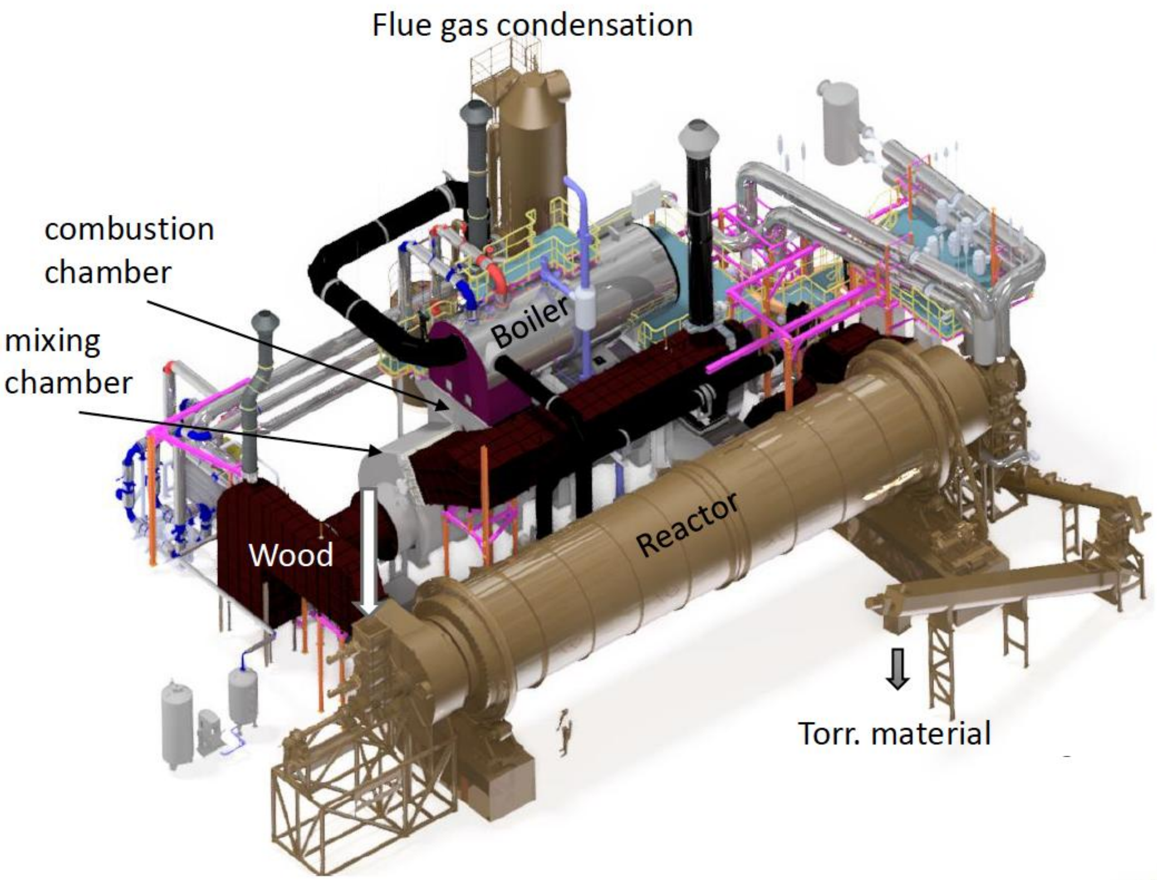
JOENSUU BIOCOAL

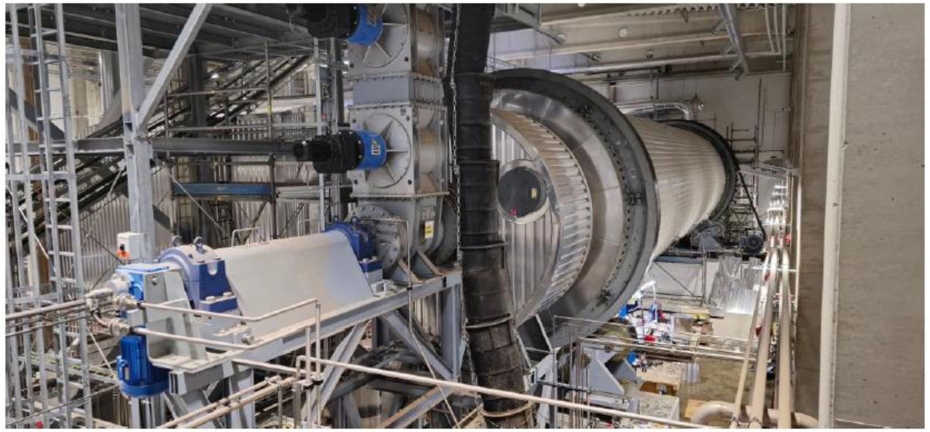
polytechnik

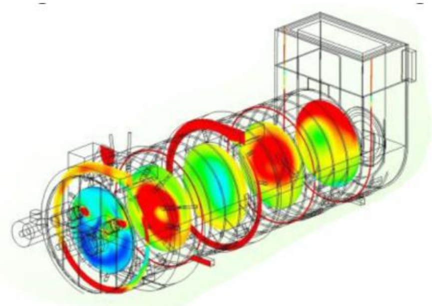
NextFuel



Torrefaction

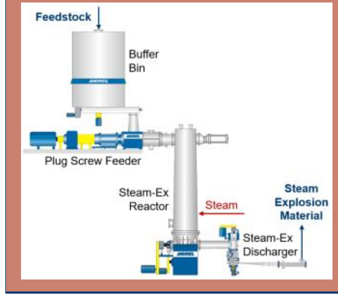


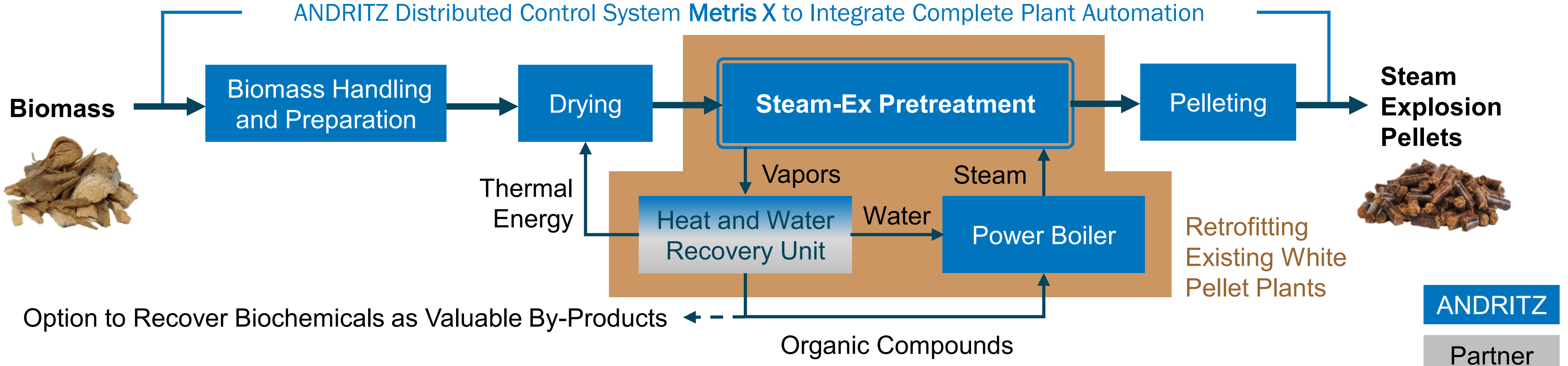




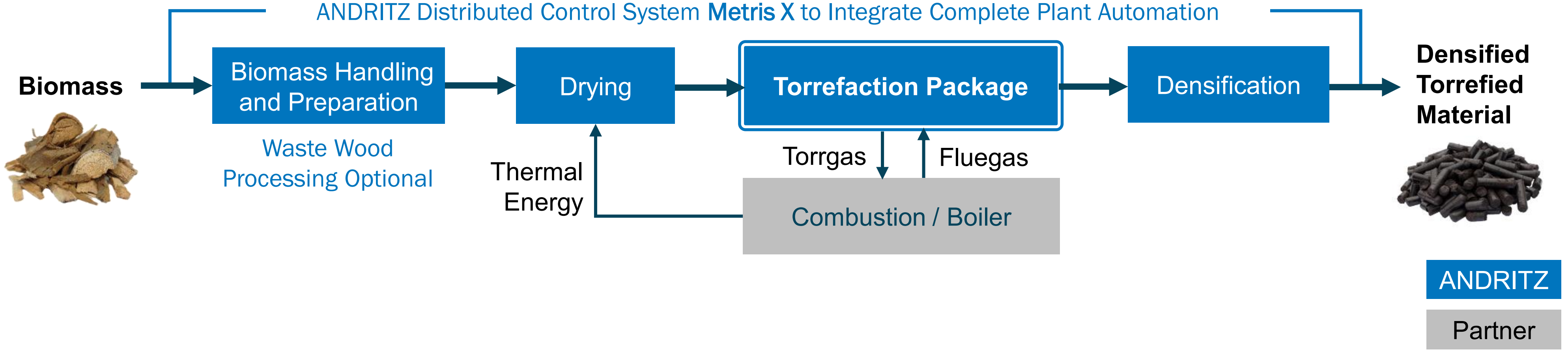
ANDRITZ ADVANCED SOLID BIOFUEL TECHNOLOGIES

Steam-Ex Pellet Line 20 bdmt/h





TorrefactionLine 8 bdmt/h



AIREX ENERGY

As an innovative leader in decarbonization solutions, Airex Energy is committed to empowering industries worldwide to reduce their greenhouse gas emissions and achieve their sustainability goals.

Using our proprietary technology, we convert biomass residues into 3 high-value products:

1. Biocoal
2. Biochar
3. Biocarbon

OUR TECHNOLOGIES COVER THE WHOLE CARBON SPECTRUM

CarbonFX

BIOCOAL

Fuel of choice to replace coal to produce electricity or heat; or to feed gasifier to produce sustainable fuels.

CarbonFX-HT

BIOCHAR

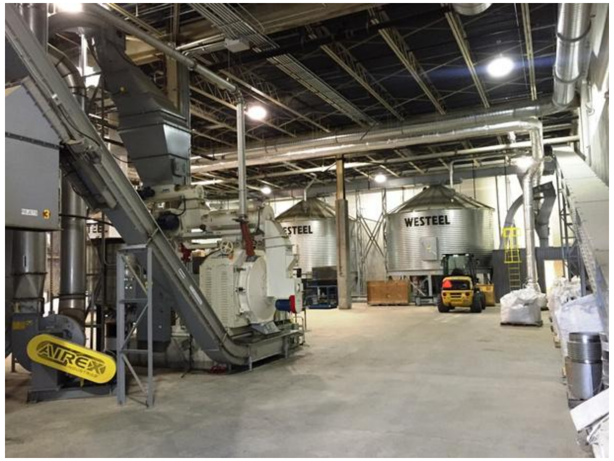
A sustainable solution for carbon sequestration as soil amendment, animal feed, building materials, etc.

BIOCARBON

High carbon & energy content product capable of replacing metallurgical coal in metal refining processes.

	BIOCOAL	BIOCHAR	BIOCARBON
Fix C%	20-25%	+70%	70 to +85%
NCV (MJ/kg)	19-20	N.A.	25-30+

PLANTS IN OPERATION



Biocoal Pellet Plant (Torrefaction technology)

Location: Bécancour, Québec, Canada
Capacity: 15,000 MT/yr
Employees: 12
Status: In operation since 2016
Ownership: 100% Airex Energy

The first and only industrial-scale biocoal pellet plant in Canada.

Carbonity Plant (Carbonization technology)

Location: Port-Cartier, Québec, Canada
Capacity: 30,000 MT/yr
Status: In operation since Q1 2025
Ownership: Joint-Venture

The largest biochar/biocarbon plant in North America arbaflame

- ***developed a renewable direct replacement alternative to coal based on sustainable biomass***

Arbacore pellets in Rotterdam

Proprietary technology and process to maximize utilization of feedstock

Key milesones

- Patented process
- Unique black pellets - ArbaCore
- Extraction of biochemicals
- Regeneration of thermal energy
- 100% certified sustainable feedstock

INPUT

Sawdust

Steam

Electrical power

Water

OUTPUT

ArbaCore

Bio-chemicals

Treated waste water

ArbaOne

LINK TO VIDEO

Source: Company information

ArbaCore is a superior coal substitute compared to white pellets

ArbaCore advantages over white pellets for coal replacement

	Coal-fired power plants can switch to ArbaCore with minimal CAPEX compared to white pellets
	Water resistant – can be stored outdoors
	40% lower volume for same energy content → lower logistics costs
	Safer handling
	Outstanding mechanical properties → lower particle size distribution
	Lower handling, storage and transport cost → can be handled similar to coal

ArbaCore has been successfully verified in 14 coal power plants

Aalborg Forsyning

RWE The energy to lead

ENGIE

EDF

SSE

HELEN

PGE

VATTENFALL

ONTARIO POWER GENERATION

ArbaCore can be stored outside, and coal firing power producers can utilize existing equipment

Sources: Company information; Forest research

Product properties of Arbacore pellets

Physical parameters	Unit	Powerplant requirement	Result
Total moisture	Weight %	≤ 10 %	8.0%
Bulk density	kg/m3	≥ 700	730
Durability	Weight %	≥98,0%	98.9%
Net calorific value at constant pressure	GJ/t	≥ 18.2	18.891
	Kcal/kg	≥ 4,347	4,512
	MWh/t	≥ 5.05	5.246
Particle size distribution	≤ 3,15mm	≥97,0%	99.65%
	≤ 2,00mm	≥98,0%	98.75%
	≤ 1,00mm	≥65,0%	80.38%

eurofins

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Provning
ISO/IEC 17025

ArbaOne production plant is certified under the Sustainable Biomass Program (SBP)

Based on test sample produced during 2021. Based on client requirement

Regular shipments for large scale industrial customers

Eirik Haugen, CEO // contact: eirik.haugen@arbaflame.no


tsi
USA-based equipment supplier offering complete processing solution for the biomass industry:
• Heat Energy Systems
• Dryer Systems
• Air Pollution Control
• Torrefaction
+1(425)771-1190 | jteal@tsi-inc.net
20818 44th Ave. W
Lynnwood, WA 98036 USA

Thailand, rubber wood (pellets)

USA, 3 TPH, any biomass

tsi

Vietnam, 2x11 TPH, Acacia (pellets)

USA, 3TPH bagasse

Aymium produces high-value BioCarbon and currently operates the largest advanced biocarbon facility in the world, located in Michigan. Aymium has been supplying customers globally from this plant since 2012.

Aymium, together with its partners, has developed a proven production process that is an important building block to help decarbonize industrial processes, like steel making, and power generation.

To date Aymium is developing and implementing Biomass Carbonisation projects in the **US and Canada in sizes 100-250.000t/a at the individual project.** Each project is implemented with an individual partner. Aymium is ready to go abroad

Aymium produces high-value biocarbon and biohydrogen products that can be used to immediately replace fossil fuels in the production of energy, metals, crops, and in the purification of water and air with no modifications to equipment or processes.

In conclusion

- Our products represent a 6000 years sucess story, now perfectly efficient produced
- Established processes with an optimized mass and energy balance with minimized material and energy waste
- Circular Biocarbon is the easiest pathway to substitute fossil carbon in all coal applications: power, processing, reduction, anode etc and can as well sequester atmospheric Carbon in permanent sinks
- Today mostly energy coal substitute. Growing consumption in processing industry and as intermediary product for higher processing like carbonization or liquefaction (SAF) close to market
- Numerous technology providers on market
- The Number of industrial size plants is rapidly growing (CAGR 67%)

Please address us

- to learn more about Circular Biocarbon
- to pre-discuss project ideas
- to be brought in touch with project developers and technology suppliers
- to join the Circular Biocarbon community
- and to create value from the just starting Circular Biocarbon revolution in energy & fossil carbon intense industries

International Biomass Torrefaction and Carbonisation Council

IBTC-COUNCIL.ORG

Shaping the Future of Circular Biocarbon.

Together.

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