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2018 EUROPEAN COAL TAR
AND
COAL TAR DISTILLATION MARKET OVERVIEW:
„BUSINESS AS USUAL”

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2018 EUROPEAN COAL TAR MARKET

- HOW MUCH COAL TAR IN EUROPE: PRODUCTION
- HOW MUCH COAL TAR IN EUROPE: IMPORT
- IS THERE ENOUGH TAR FOR EVERYBODY?
- TAR PRICES: ARE THEY OVERHEATED?
- TAR PROCESSING COMPANIES IN EUROPE 2018: A CLOSER LOOK
- MARKET FOR COAL TAR PRODUCTS IN EUROPE
- THE FUTURE: THREATS & OPPORTUNITIES

HOW MUCH COAL TAR IN EUROPE – PRODUCTION IN EU (1)

COMPANY	LOCATION	2018 INSTALLED COKE CAPACITY, MLN T/Y	TAR 2017 (kt)	TAR 2018 (kt) estimation
ARCELORMITTAL	Ghent, Belgium	1.3	45	46
	Ostrava, Czech Rep.	1.5	47	50
	Dunkerque, France	1.4	56	56
	Florange, France	0.7	21	20
	Fos-sur-Mer, France	1.4	40	40
	Bottrop, Germany	2.0	70	70
	Taranto, Italy	1.8	50	50
	Zdzieszowice, Poland	4.2	155	150
	Kraków, Poland	0.6	25	25
	Aviles, Spain	1.4	58	55
Total AM		**16.3**	**567**	**562**

HOW MUCH COAL TAR IN EUROPE – PRODUCTION IN EU (2)

COMPANY	LOCATION	2018 INSTALLED CAPACITY, MLN T/Y	TAR 2017 (kt)	TAR 2018 (kt) estimation
Huttenwerke Krupp Mannesman (HKM)	Huckingen, Germany	2.4	89	90
Thyssen Krupp Stahl	Schwelgern, Germany	2.8	111	110
Saltzgitter	Saltzgitter, Germany	1.5	62	63
Zentralkokerei Saar	Dillingen, Germany	1.3	49	50
JSW Koks	Zabrze, Poland (Jadwiga, Radlin)	0.9	48	36
JSW Koks	Dąbrowa Górnicza, Poland (Przyjaźń)	2.6	98	96
Tata Steel	Ijmuiden, Netherlands	2.2	75	78
Tata Steel	Port Talbot, UK	0.7	29	30
British Steel	Scunthorpe, UK	0.7	20	25
Voest Alpine	Linz, Austria	1.4	41	40
US Steel	Kosice, Slovakia	1.7	55	55

HOW MUCH COAL TAR IN EUROPE – PRODUCTION IN EU (3)

COMPANY	LOCATION	2018 Installed Coke Capacity, mln t/y	Tar 2017, kt	Tar 2018, kt estimation
OKD - OKK	Ostrava, Czech Rep.	0.8	21	20
Trinecke Zelezarny	Trinec, Czech Rep.	0.7	29	30
SSAB	Raahe, Finland	0.9	33	33
SSAB	Lulea, Sweden	0.7	27	25
SSAB	Oxelosund, Sweden	0.45	14	15
Arvedi	Triest, Italy	0.4	8	10
Italiana Coke	San Guiseppe di Cairo, Italy	0.5	14	15
Częstochowa Nowa	Częstochowa, Poland	0.7	28	30
WZK Victoria	Wałbrzych, Poland	0.6	15	16
Industrial Quimica del Nalon	Langreo, Spain	0.15	4	4
Total EU except		**30.0**	**870**	**871**

HOW MUCH TAR IN EUROPE – PRODUCTION OUTSIDE EU (1)

COMPANY	LOCATION	2018 Installed Coke Capacity, mln t/y	Tar 2017, kt	Tar 2018, kt estimation
Severstal	Cherepovets, Russia	5.1	200	204
NLMK	Novolipetsk, Russia	2.4	82	85
NLMK – Altay Koks	Zarinsk, Russia (Siberia)	4.4	170	165
Mechel Koks	Chelyabinsk, Russia (Ural)	3.5	120	118
Mechel Koks	Vidnoye (Moscow), Russia	1.2	48	47
Gubakha Koks	Gubakha, Russia (Ural)	1.3	23	25
Magnitogorskiy Met. Komb. (MMK)	Magnitogorsk, Russia (Ural)	6.2	185	190
Evraz - NTMK	Nizhny Tagil, Russia (Ural)	2.7	80	80
Evraz - Zapsib	Novokuznetsk, Russia (Siberia)	3.6	160	160
Metholding	Kemerovo, Russia (Siberia)	2.7	45	45
Ural Steel	Novotroitsk, Russia (Ural)	1.3	30	30

HOW MUCH COAL TAR IN EUROPE – PRODUCTION OUTSIDE EU (2)

Company	Location	2018 coke capacity, mln t/y	Tar 2017, kt	Tar 2018, kt
ArcelorMittal	Zenica, Bosnia	0.7	16	14
Global Ispat (GIKIL)	Lukavac, Bosnia	0.7	12	12
ISD	Alchevsk, Ukraine *	?	40	?
Metinvest	Avdeyevka, Ukraine	4.0	90	95
Metinvest	Yenakiyevo, Ukraine*	1.0	20	?
Metinvest	Mariupol, Ukraine	2.6	56	60
Metinvest	Zaporozhya, Ukraine	1.7	45	50
Metinvest	Dniprodzerzhinsk, Ukr.	1.0	26	30
Istek	Gorlovka, Ukraine*	?	10	?
Evraz - Dniprokoks	Dnipropetrovsk, Ukraine	0.9	28	30
Evraz - Yuzhkoks	Dniprodzerzhinsk, Ukr.	0.9	26	28
Donetsk-steel	Makeyevka, Ukraine*	?	36	?
Donetsk-steel	Yasinovka, Ukraine *	?	0	0
Donetsk-koks	Donetsk, Ukraine*	?	12	?
ArcelorMittal	Kriviy Rih, Ukraine	3.0	80	90
Kharkiv Coke	Kharkiv, Ukraine	0.2	6	6

* SPECIAL NOTE: UKRAINE

- December 18, 2017; 19:16
- Industrial Union of Donbas (ISD) Corporation has officially announced today the actual loss of effective managerial control over its production assets (industrial sites and office premises) in Alchevsk, Luhansk Region, including Alchevsk Iron & Steel Works, Alchevsk Coke and Chemical Plant (Alchevskoks) and Ecoenergy, which together constitute a significant part of the ISD Group.

- Similar announcements came from Donetsk-steel (Yasinovka, Makeyevka), Istek (Gorlovka), and Metinvest (Yenakiyevo).

HOW MUCH TAR IN EUROPE – PRODUCTION SUMMARY

Region	Tar 2017, kt	Tar 2018, kt (estimation)
European Union	**1.437**	**1.433**
- including ArcelorMittal	567	562
ArcelorMittal share in EU, %	**39.5**	**39.2**
Bosnia	28	26
- Including ArcelorMittal	16	14
ArcelorMittal share in Bosnia, %	**57.1**	**53.8**
Russian Federation	**1.143**	**1.149**
Ukraine	**475**	**383***
- Including ArcelorMittal	80	90
ArcelorMittal share in Ukraine, %	**16.8**	**23.5**
TOTAL EUROPE	**3.083**	**2.991**
- Including ArcelorMittal	**663**	**666**
ArcelorMittal's share , %	**21.5**	**22.3**

HOW MUCH COAL TAR IN EUROPE:
IMPORT, EXPORT, AND INTRAEUROPEAN TRADE, kt

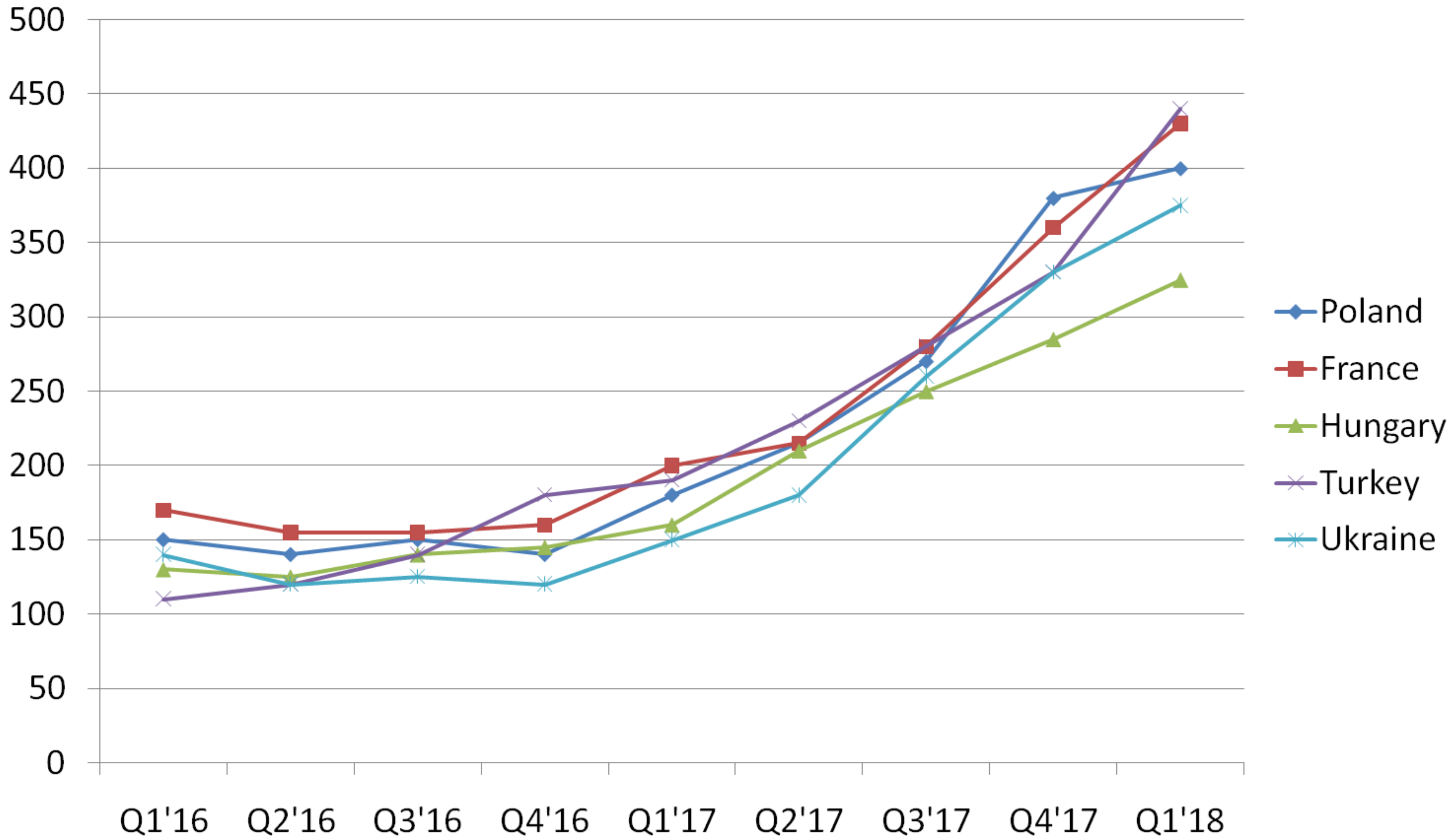
2017 import to:		**EU**	**Russia**	**Ukraine**
From:	Brazil	41	-	-
	Canada	35	-	-
	Turkey	99	-	-
	Russia	102		
	Ukraine	96		
	Kazakhstan	-	24	5
	Total import to:	**373**	**24**	**5**
	Production in:	**1.437**	**1.143**	**383**
2017 export from:		**EU**	**Russia**	**Ukraine**
To:	Canada	20	-	-
	EU		102	96
Total available in:		**1.790**	**1.065**	**292**

IS THERE ENOUGH TAR FOR EVERYBODY IN EUROPE?

	EU	Russia	Ukraine	Total Europe
Tar theoretically available: (kt)	1.790	1.065	292	3.140
Really available: (kt)	1.650	900	290	2.840
Installed processing capacity: (ktpy)	2.075	1.400	600	4.075
Real average capacity utilization rate: %	79,5	64,3	48,3	69,7

TAR PRICES IN EUROPE 2016 – 2018

(Poland, France, and Hungary contracted in Euro/t ex works or FOB, Turkey and Ukraine contracted in US$/t, recalculated here for Euro/t)



TAR PROCESSING COMPANIES IN EUROPE 2018

Company	Plant	Tar distilation capacity, kt/y	Est. processing 2018, kt
Rain Carbon Inc.	Castrop Rauxel, Germany	500	440
	Zelzate, Belgium	300	290
	Cherepovets, Russia (j-v)	300	250
Deza a.s.	Valasske Mezirici, Czech R.	460	400
Koppers Intern. BV	Nyborg, Denmark	300	290
Ind. Quimica d. Nalon	Trubia, Spain	370	250
Bilbaina de Alquitranes	Bilbao, Spain	145	110
Metinvest	Avdeyevka, Ukraine	200	110
	Zaporozhya, Ukraine	200	100
	Dniprodzerzhinsk, Ukraine	200	90
MMK	Magnitogorsk, Russia	350	200
Mechel	Chelyabinsk, Russia	200	110
Evraz	Novokuznetsk, Russia	400	320
Evraz	Nizhniy Tagil, Russia	150	100
Total Europe		**4.075**	**3.060**

TAR PROCESSING COMPANIES IN EUROPE – A CLOSER LOOK 1

- **RAIN CARBON INC. (RCI)**
- RCI, with headquarters in Stamford, Connecticut, is a holding company comprising of Rain CII and Ruetgers. Rain CII arm operates several petcoke calcination units in America and India, while Ruetgers runs **tar processing plants** in Europe (listed before) and Canada (Hamilton). The total tar processing capacity is 1.3 mln tpy.
- By keeping under one roof manufacturing of calcined petcoke and electrode pitch RCI is in a position to offer „full package” of electrode raw materials to customers around the world.
- Ruetgers tar processing plants in the EU (Zelzate and Castrop Rauxel) are perfectly positioned from the logistic point of view: Zelzate is located at the bank of Terneuzen – Gent channel, accessible for deep water vessels, and at the same time connected with main customers, sister plant in Castrop Rauxel, and other Ruetgers downstream plants (e.g. Duisburg) via the North Western Europe network of rivers and channels.

TAR PROCESSING COMPANIES IN EUROPE – A CLOSER LOOK 2

- **KOPPERS INTERNATIONAL B.V.**
- Koppers Int. B.V. is a part of Koppers Inc., an American corporation with headquarters in Pittsburgh, active in three segmensts: RUPS – Rail and Utility Products & Services (creozote impregnated wooden poles and rail ties), PC – Performance Chemicals (specialty coating products) and CMC – Carbon Material and Chemicals.
- CMC segment operates tar processing plants in USA (Stickney, Illinois), Australia (Newcastle, NSW), Europe (Nyborg, Denmark) and China (Pizhou, Jiangsu Province). Its total tar processing capacity is evaluated at some 1.1 mln tpy.
- Nyborg plant, located at one of fjords of Kattegat Straits connecting Baltic Sea with Atlantic Ocean, enjoys easy access to ports in Sweden, Finland, Latvia, Russia, Poland, UK and Netherlands for collecting feedstock tar, and servicing customers for pitch and oil products around the world.

TAR PROCESSING COMPANIES IN EUROPE – A CLOSER LOOK 3

- **DEZA a.s.**
- Deza is a part of Agrofert Group, one of the biggest corporation in Czech Republic, active mainly in agriculture and chemistry sectors.
- Its production facilities in Valasske Mezirici are landlocked, but got an easy road and railway access to producers of coal tar in the Republic and abroad: in Poland, Slovakia, Hungary, Austria, and Ukraine.
- Pitch produced by Deza is supplied to Central and Eastern Europe aluminium smelters, and – through the company's liquid and solid pitch terminals in Polish ports of Świnoujście and Szczecin – to customers further away. Next door to Deza is its carbon black manufacturing joint venture with Cabot Corp. „Valdez".
- In addition to a 460 ktpy tar distillation unit, Deza operates several downstream plants: crude benzene distillation/rafination, phenols separation, naphthalene distillation/rafination, phthalic anhydride, anthracene separation and oxidation.

TAR PROCESSING COMPANIES IN EUROPE – A CLOSER LOOK 4

- **INDUSTRIAL QUIMICA DEL NALON S.A. (IQN)**
- IQN is a privately owned holding with headquarters in Oviedo, Spain. In addition to a 370 ktpy tar processing plants in Trubia (some 30 km west from Oviedo), IQN industrial segment runs also a 130 ktpy foundry coke plant in Langreo.
- Trubia tar processing facilities consist of the 250 ktpy continuous distillation unit and two 60 ktpy each batch units, plus naphthalene distillation and hydrorafination unit.
- Feedstock tar is delivered to Trubia by road tankers from IQN's terminal in the port of Aviles, which serves also as the loading facility for the tar products. Important part of feedstock tar comes from ArcelorMittal coking plant in Aviles.
- The company serves mainly Spanish customers for pitch (there are three Alcoa aluminium smelters in Spain with total capacity 400 ktpy and two graphite electrodes plants) and carbon black feedstock. It operates also actively at other European and global markets.

TAR PROCESSING COMPANIES IN EUROPE – A CLOSER LOOK 5

- **BILBAINA DE ALQUITRANES S.A. (BASA)**
- BASA is the other Spanish privately owned company, located near the city of Bilbao. Its facilities comprise a 70 ktpy continuous tar distillation unit, a 50 ktpy batch unit, another 35 ktpy batch unit capable of processing petrol – derived tars, and an extra 15 ktpy batch unit for redistillation of primary oils coming from continuous plant.
- The company is located at the bank of Bilbao river, accessible for deep-sea vessels. Majority of feedstock tar is delivered by sea, mainly from Turkey, France, Italy, and Poland. Auxiliary amount comes from ArcelorMittal coking plant in Aviles by road tankers.
- Tar products are offered at the Spanish and international markets.

TAR PROCESSING COMPANIES IN EUROPE – A CLOSER LOOK 6

- **METINVEST**
- Metinvest is one of the major Ukrainian vertically integrated conglomerates, active in mining iron ore (27 mln tons in 2017), coal, including coking coal, as well as operating several steel works.
- Currently (2018) the Group operates only three of its tar distillation plants (Avdeyevka, Zaporozhya, and Dniprodzerzhinsk) out of the former six, processing some 300 kt of feedstock tar.
- „On March 2017, assets owned by the Group subsidiaries like Yenakiieve Iron & Steel Works (including Makiivka branch), Donetsk Coke and its affiliate Yenakiive Coke, which are located in the territory not controlled by the Ukrainian government, **were seized following an ultimatum issued by the unrecognized local authorities to re-register these assets”.**
- „In early 2017 Avdiivka experienced power cut due to heavy shelling that damaged power transmission lines. This forced the plant to scale back coke production for three-month period…”

TAR PROCESSING COMPANIES IN EUROPE – A CLOSER LOOK 7

- **EVRAZ**
- Evraz plc is a global steel and mining company, listed at London Stock Exchange (EVR). The company's main assets are iron ore mines (2017 production 18 mln tons), coal mines (mainly open cast), and steelworks. In addition to Russia, Kazakhstan and Ukraine, Evraz steel segment assets are located in Switzerland, Czech Republic, Italy, USA and Canada.
- Two of Evraz Russian integrated steelworks: Nizhniy Tagil (Ural) and Novokuznetsk (Siberia) run tar processing plants. Total installed distillation capacity (550 ktpy) is utilized at some 78 % (2017).
- Tar products are sold mainly at the local Russian market. Some pitch produced at Novokuznetsk tar distillation plant is utilized as a coal blend component at the coking plant.

TAR PROCESSING COMPANIES IN EUROPE – A CLOSER LOOK 8

- **MMK (Magnitogorsky Metallurgichesky Kombinat)**
- MMK is the biggest Russian integrated steelworks, located in Ural. It is also the biggest single coke plant in the country, with 9 batteries of total installed capacity 6.2 mln tpy. However, real production of coke is much lover and does not exceed 5.2 mln tons (2017). Coking coal is supplied from the company's own coal mines.
- Only one of the two distillation units are operational (200 ktpy). Pitch produced at Magnitogorsk used to serve as a feedstock for pitch coking plant, but production of pitch coke (in a standard type cokemaking battery) has ceased some years ago due to environmental reasons.
- Current tar processing leads to standard products: electrode pitch (by air blowing), carbon black feedstock, wash oil, crude naphthalene.

TAR PROCESSING COMPANIES IN EUROPE – A CLOSER LOOK 9

- **MECHEL STEEL GROUP**
- Mechel Steel Group is another Russian vertically integrated company, active in coal and iron ore mining, production of steel, and downstream production of steel products. Its main steelwork is located in Chelyabinsk (Ural), where the company's subsidiary Chelyabinsk Coke & Chemicals Products Plant runs 8 cokemaking batteries of total installed coke capacity 3.5 mln tpy. As some batteries are inactive, real production of coke does not exceed 2 mln tons (2017).
- In 2006 Mechel Group has acquired merchant coke producer Moscow Coke & Gas Plant at Vidnoye, of 1.2 mln tpy capacity. Real coke output there was 0.7 mln tons in 2017, tar output 30 kt.
- Chelyabinsk Coke & Chemicals Plant operates a single 200 ktpy tar distillation unit. Real processing in 2017 was 110 kt, with standard products directed towards local market.

MARKET FOR COAL TAR PRODUCTS IN EUROPE 2018: PITCH

- The wave of smelter closures 2011 – 2014 is over. Production of primary aluminium is stable (or slightly increasing due to restarting of idled lines) in both „Western" and „Eastern" Europe: WE – 3.6 mln tons in 2014 up to 3.78 mln tons in 2017; EE – 3.76 mln tons in 2014 up to 4.0 mln tons in 2017.
- The newest RUSAL's Siberian „Boguchansky" smelter is already operational (149 ktpy), final capacity: 600 ktpy.
- Aluminium prices have increased from 1.500 US$/t in January 2016 to 2.400 US$ in June 2018, averaging 2.200 US$/t in 2017.
- Graphite electrodes industry enjoys tremendous run; electrodes prices are skyrocketing – no more talks about closing plants (SGL mourning the sale of the whole GE segment to Showa Denko just before the current bonanza?)
- Growing market for Li – Ion batteries, which require needle coke and some pitch, creates new opportunities for tar processing companies.

MARKET FOR COAL TAR PRODUCTS IN EUROPE 2018: CBF

- Carbon black manufacturing plant closures we observed in Europe for several years is the story of the past (the last victim was Orion's Ambes plant, closed at the end of 2016).
- May 22, 2018: „Through the combination of a plant expansion, operational improvements, and debottlenecking projects, **CABOT** is expanding its global capacity by over 300,000 metric tons per year"
- In September 2017 **BIRLA CARBON** put into operation a new carbon black plant in China and is currently debottlenecking its Italian plant.
- **OMSK CARBON GROUP** is just putting into operation (September 2018) the first line of its new facility at Mogilev, Belarus. The final capacity, to be achieved by 2022, is 200,000 metric tons per year.
- **ORION ENGINEERED CARBONS**: price increases for rubber carbon blacks in North America from June 1, 2018, in EMEA from August 1 2018; for specialty carbon blacks worldwide from January 1, 2018.

EUROPEAN COAL TAR INDUSTRY 2018 AND BEYOND

- **„Business as usual”** for the existing tar processing companies in EU.
- **To be observed:** ArcelorMittal plans regarding Southern Europe facilities: will Gijon fully replace Aviles in time? What is the future of the coking plant at Taranto?
- **To be observed:** JSW Koks in Poland gradually rebuilding its batteries at „Przyjaźń” plant.
- Still unclear situation around **Eastern Ukraine:** is there a chance for returning to normality there? Where go the products from facilities taken over by separatist forces?
- Is there a chance for somebody to repeat **Rain Carbon Inc.** success in **Russia**? Is Chinese pitch export to Siberian smelters to be continued?
- **To be observed:** two countries with significant production of coal tar and lack of processing plant(s): Poland – ca. 380,000 mtpy, and Turkey – ca. 160,000 mtpy. Is there a time to build a modern tar processing plant there?

THANK YOU VERY MUCH

- Parts of this presentation wouldn’t be possible without the data supplied by Mr. Vince Guercio of CTC International, USA. Many thanks, Vince.

- Opinions expressed in the presentation are private opinions of the author, who is not in any relationship with any company engaged in production of coke or processing of coke-oven tar.

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