Europe gas inventories and prices
Selected indicators

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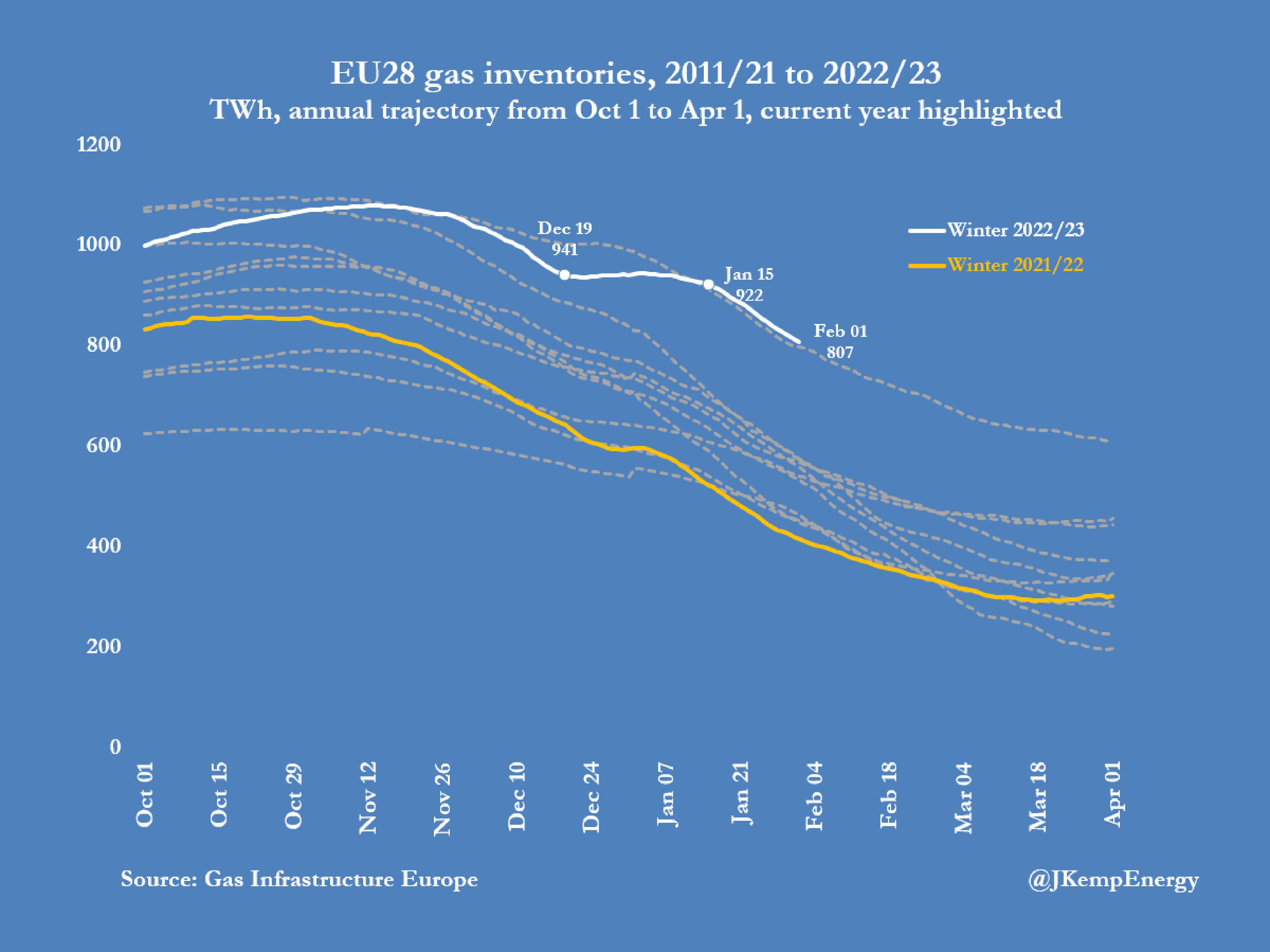
REUTERS
3 February 2023


EU28 gas inventories, 2011/21 to 2022/23
TWh, annual trajectory from Oct 1 to Apr 1, current year highlighted
1200
1000
800
600
400
200
0
Dec 19
941
Jan 15
922
Feb 01
807
Winter 2022/23
Winter 2021/22
Oct 01
Oct 15
Oct 29
Nov 12
Nov 26
Dec 10
Dec 24
Jan 07
Jan 21
Feb 04
Feb 18
Mar 04
Mar 18
Apr 01
Source: Gas Infrastructure Europe
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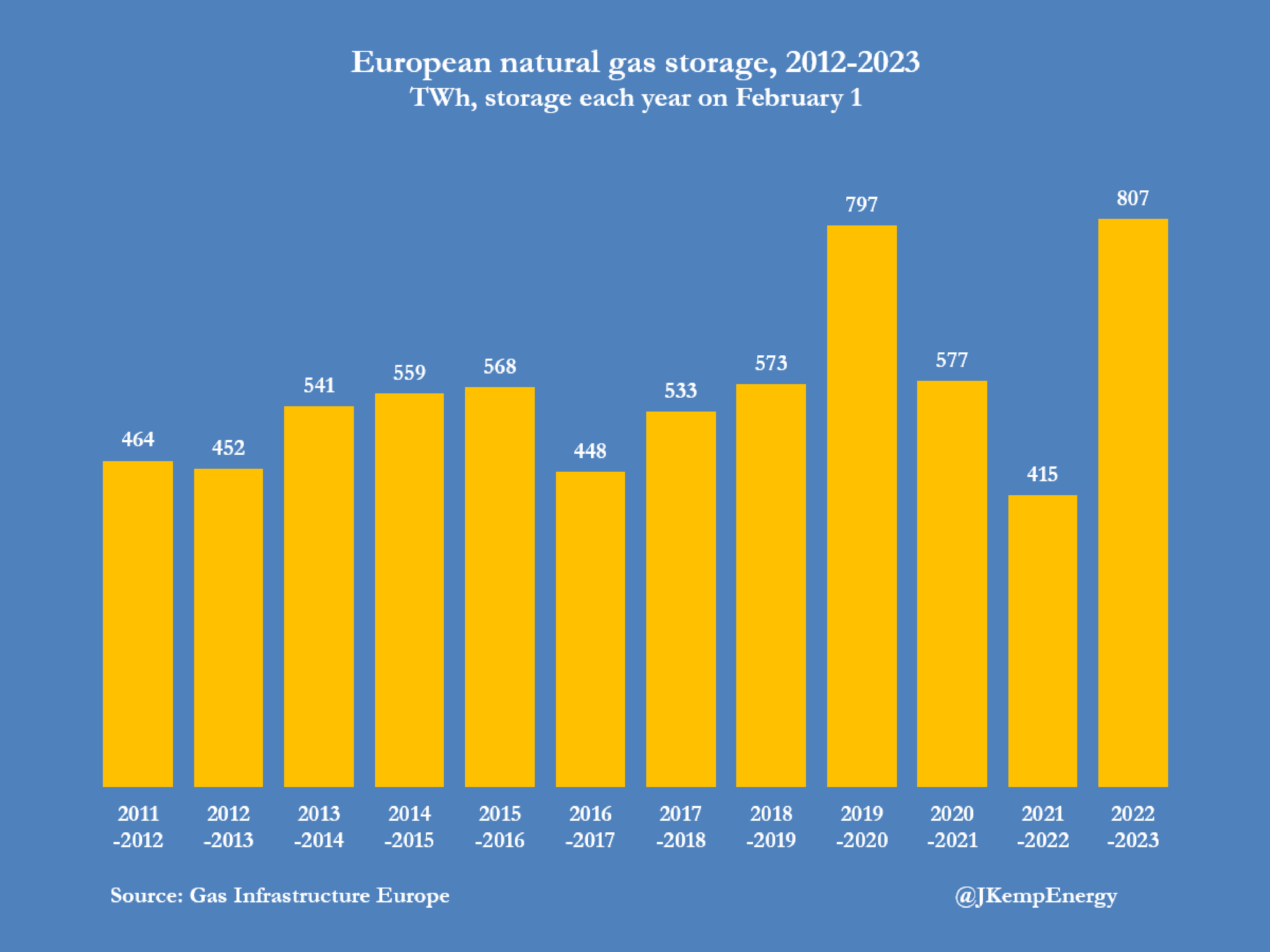
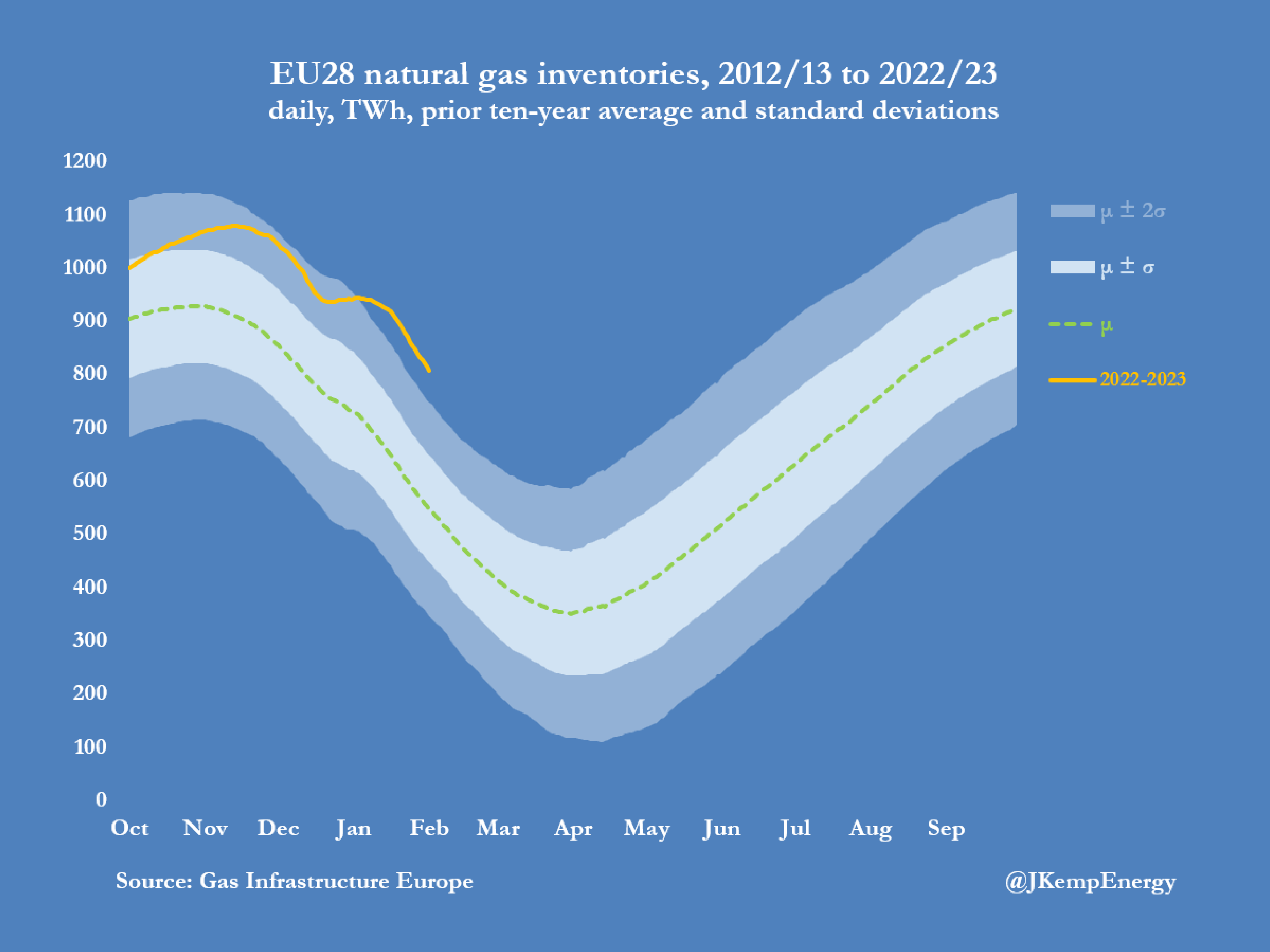

European natural gas storage, 2012-2023
TWh, storage each year on February 1
464
452
541
559
568
448
533
573
797
577
415
807
2011 -2012
2012 -2013
2013 -2014
2014 -2015
2015 -2016
2016 -2017
2017 -2018
2018 -2019
2019 -2020
2020 -2021
2021 -2022
2022 -2023
Source: Gas Infrastructure Europe
@JKempEnergy


EU28 natural gas inventories, 2012/13 to 2022/23
daily, TWh, prior ten-year average and standard deviations
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
μ ± 2σ
μ ± σ
μ
2022-2023
Source: Gas Infrastructure Europe
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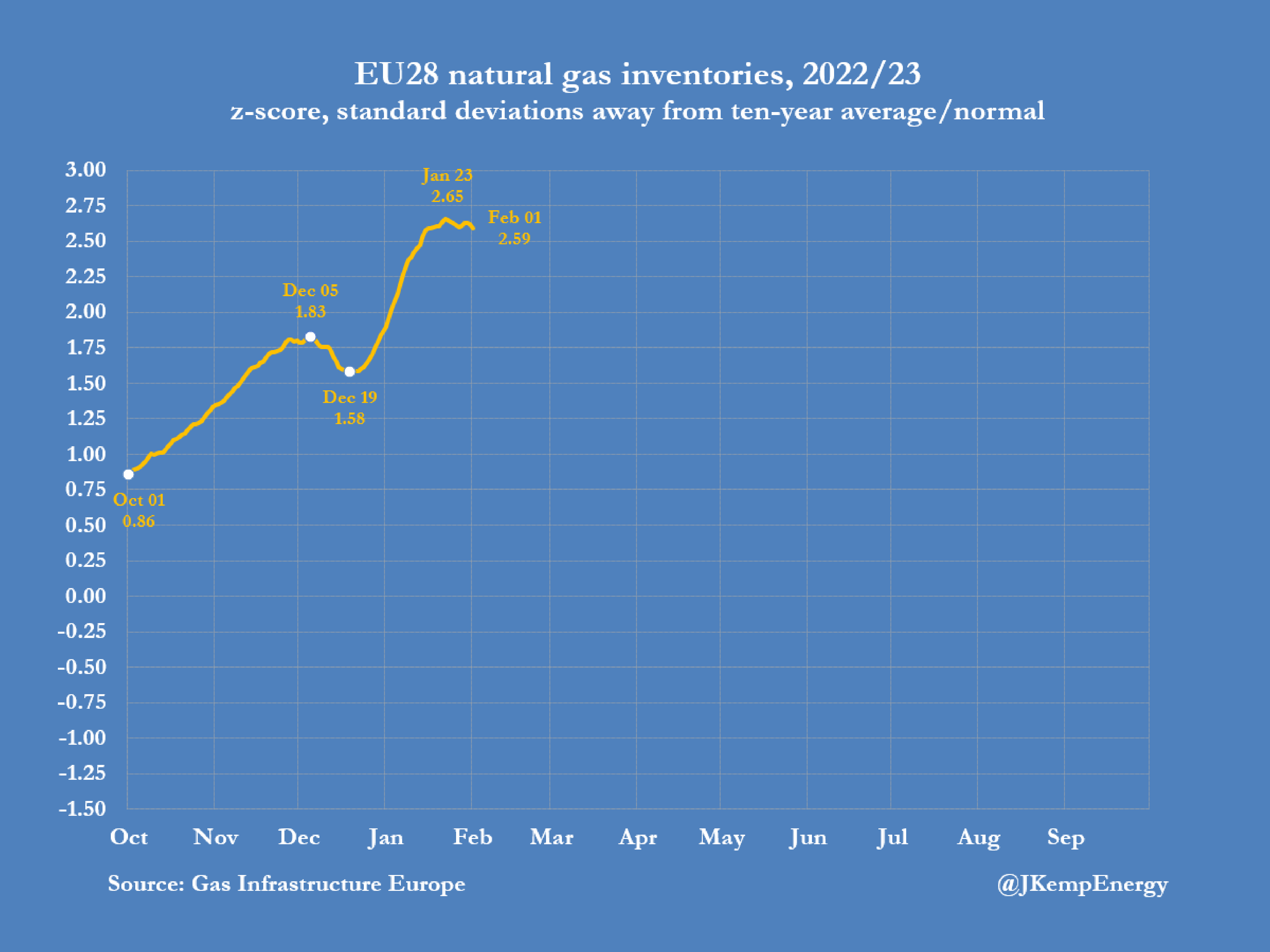
EU28 natural gas inventories, 2022/23
z-score, standard deviations away from ten-year average/normal
3.00
2.75
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
-0.25
-0.50
-0.75
-1.00
-1.25
-1.50
Oct 01
0.86
Dec 05
1.83
Dec 19
1.58
Jan 23
2.65
Feb 01
2.59
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Source: Gas Infrastructure Europe
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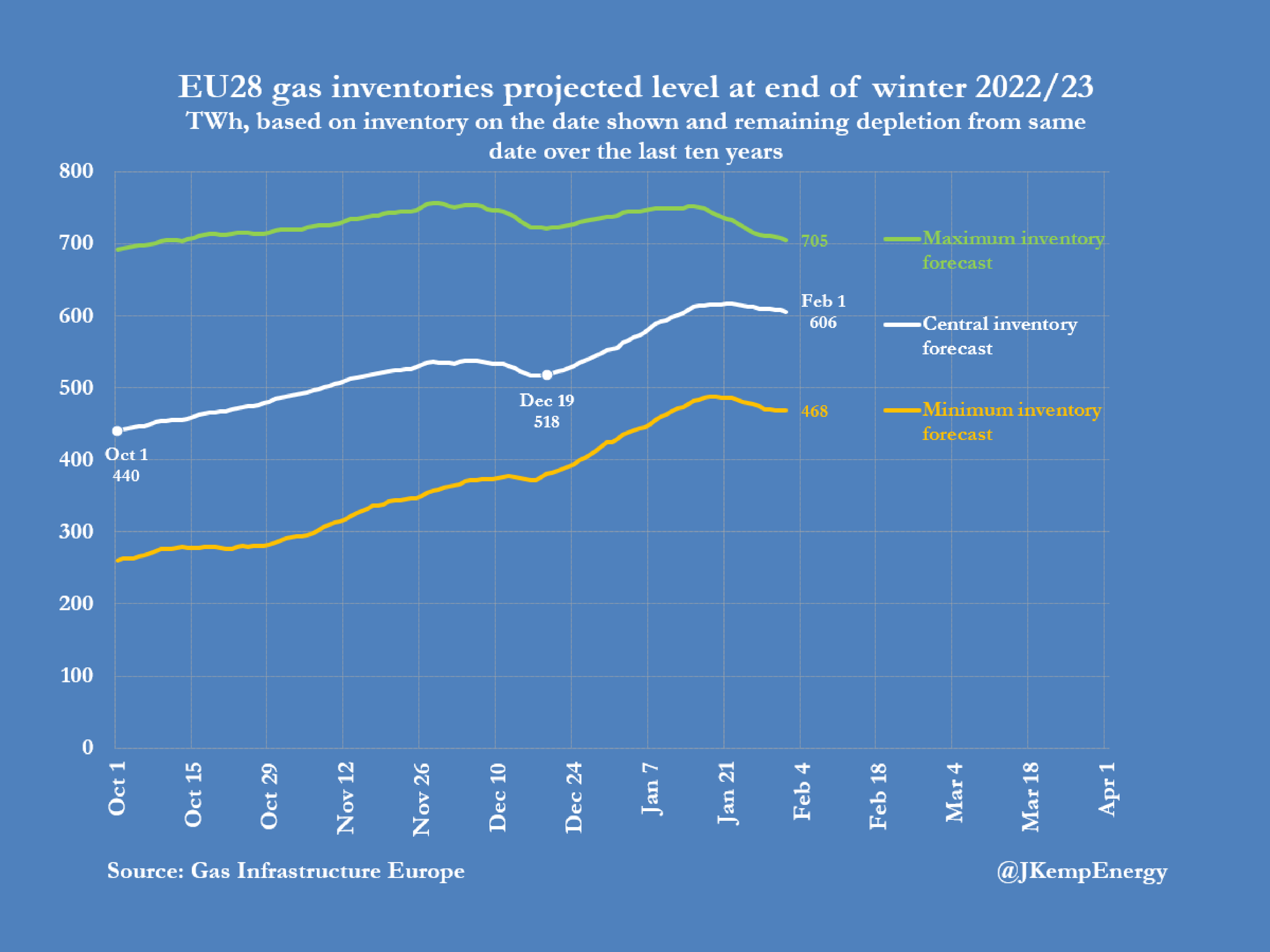
EU28 gas inventories projected level at end of winter 2022/23
TWh, based on inventory on the date shown and remaining depletion from same date over the last ten years
800
700
600
500
400
300
200
100
0
Oct 1
Oct 15
Oct 29
Nov 12
Nov 26
Dec 10
Dec 24
Jan 7
Jan 21
Feb 4
Feb 18
Mar 4
Mar 18
Apr 1
705
Maximum inventory forecast
Feb 1
606
Central inventory forecast
Dec 19
518
Oct 1
440
468
Minimum inventory forecast
Source: Gas Infrastructure Europe
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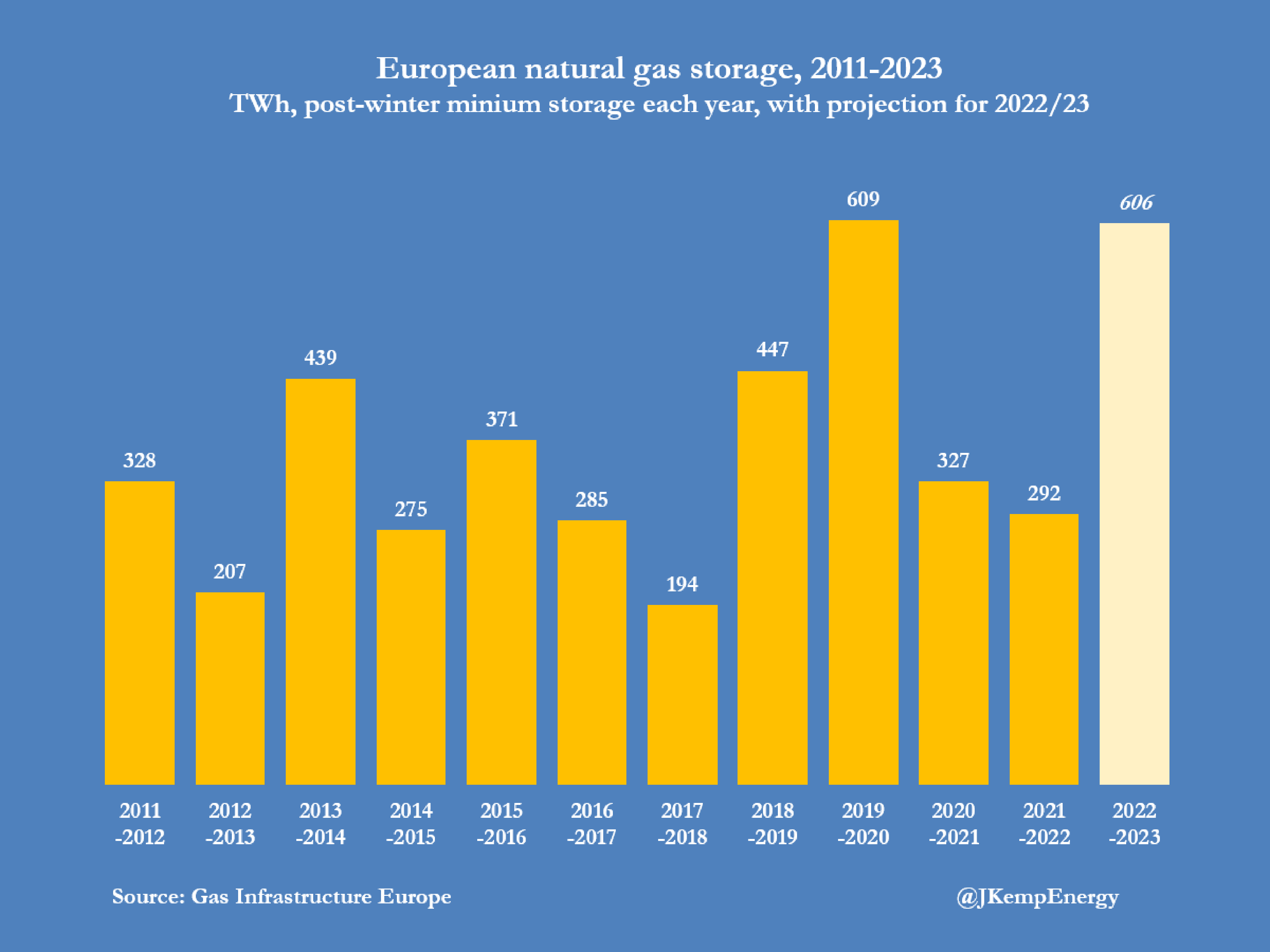
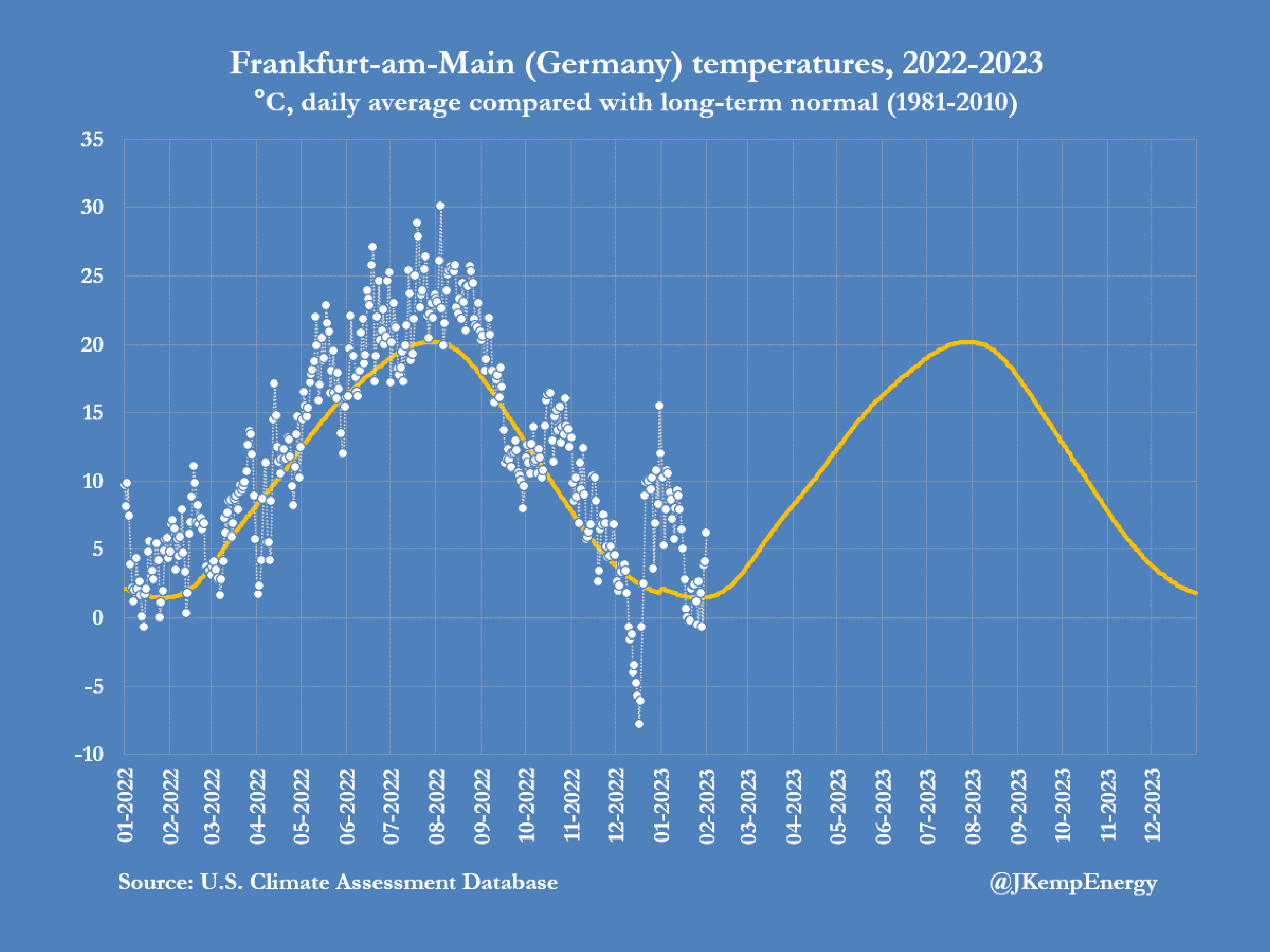

European natural gas storage, 2011-2023
TWh, post-winter minium storage each year, with projection for 2022/23
328
207
439
275
371
285
194
447
609
327
292
606
2011 -2012
2012 -2013
2013 -2014
2014 -2015
2015 -2016
2016 -2017
2017 -2018
2018 -2019
2019 -2020
2020 -2021
2021 -2022
2022 -2023
Source: Gas Infrastructure Europe
@JKempEnergy


Frankfurt-am-Main (Germany) temperatures, 2022-2023
°C, daily average compared with long-term normal (1981-2010)
35
30
25
20
15
10
5
0
-5
-10
01-2022
02-2022
03-2022
04-2022
05-2022
06-2022
07-2022
08-2022
09-2022
10-2022
11-2022
12-2022
01-2023
02-2023
03-2023
04-2023
05-2023
06-2023
07-2023
08-2023
09-2023
10-2023
11-2023
12-2023
Source: U.S. Climate Assessment Database
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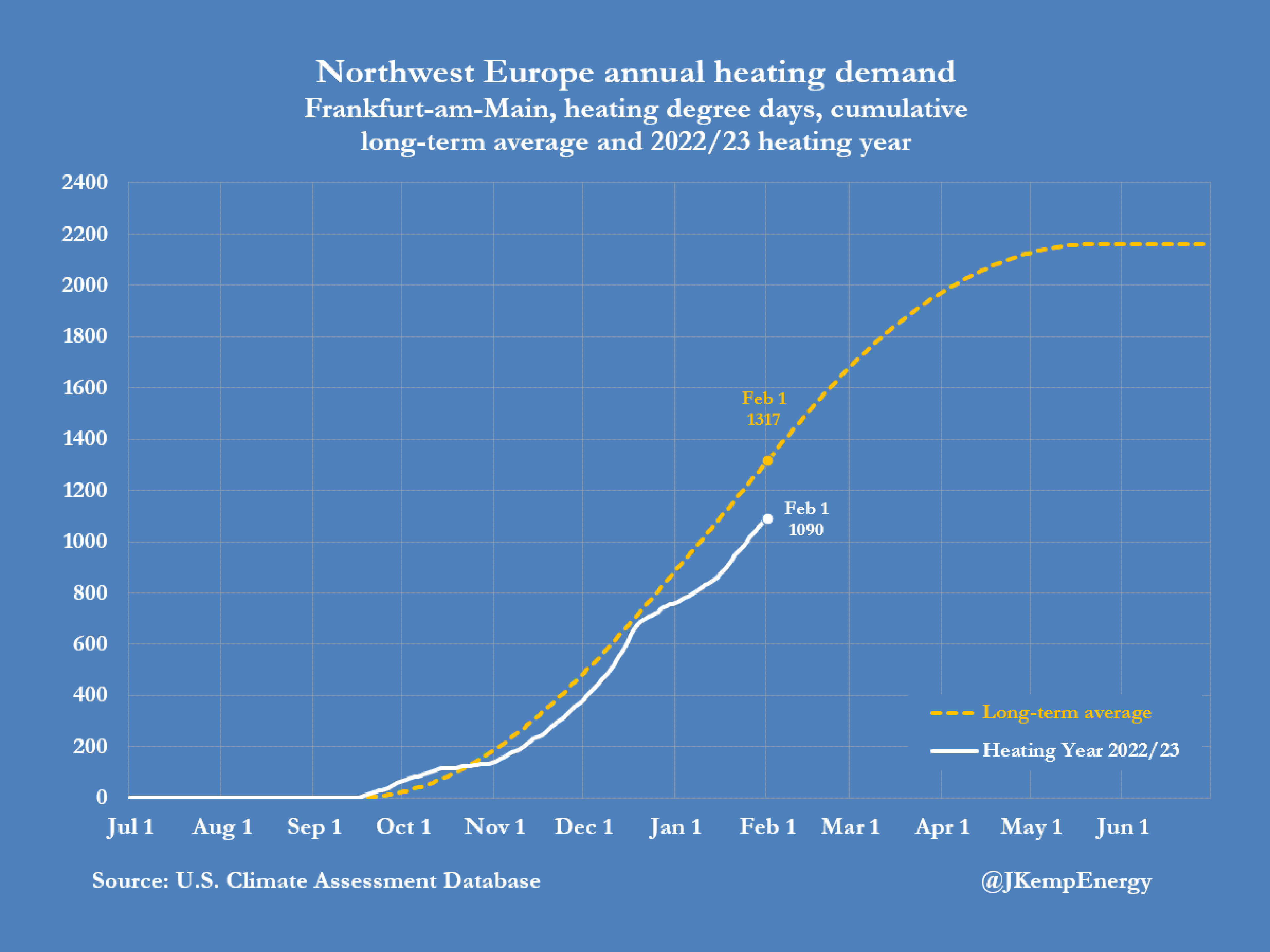

Northwest Europe annual heating demand
Frankfurt-am-Main, heating degree days, cumulative
long-term average and 2022/23 heating year
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Feb 1
1317
Feb 1
1090
Long-term average
Heating Year 2022/23
Jul 1
Aug 1
Sep 1
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Source: U.S. Climate Assessment Database
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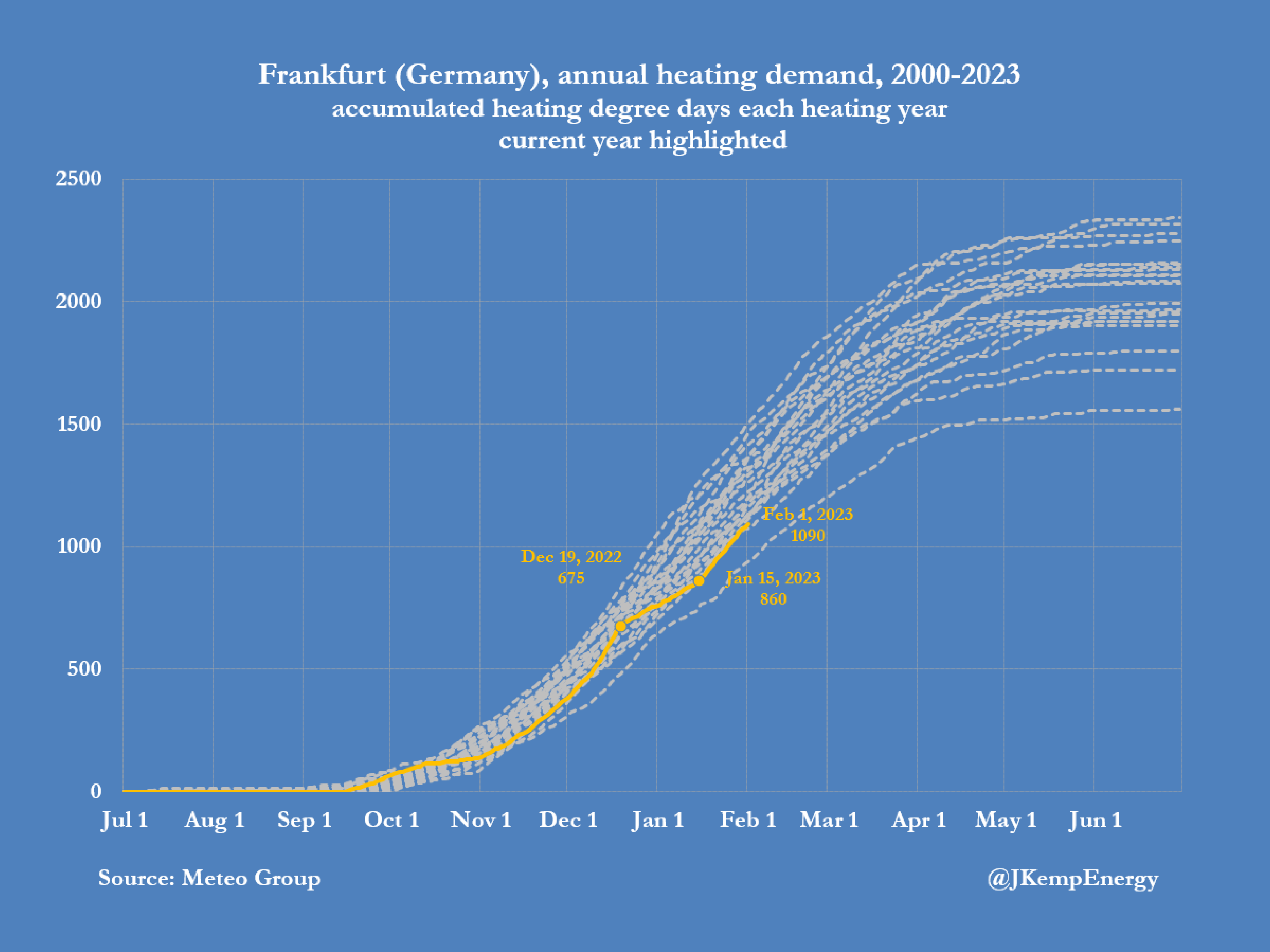
Frankfurt (Germany), annual heating demand, 2000-2023
accumulated heating degree days each heating year
current year highlighted
2500
2000
1500
1000
500
0
Jul 1
Aug 1
Sep 1
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Dec 19, 2022
675
Jan 15, 2023
860
Feb 1, 2023
1090
Source: Meteo Group
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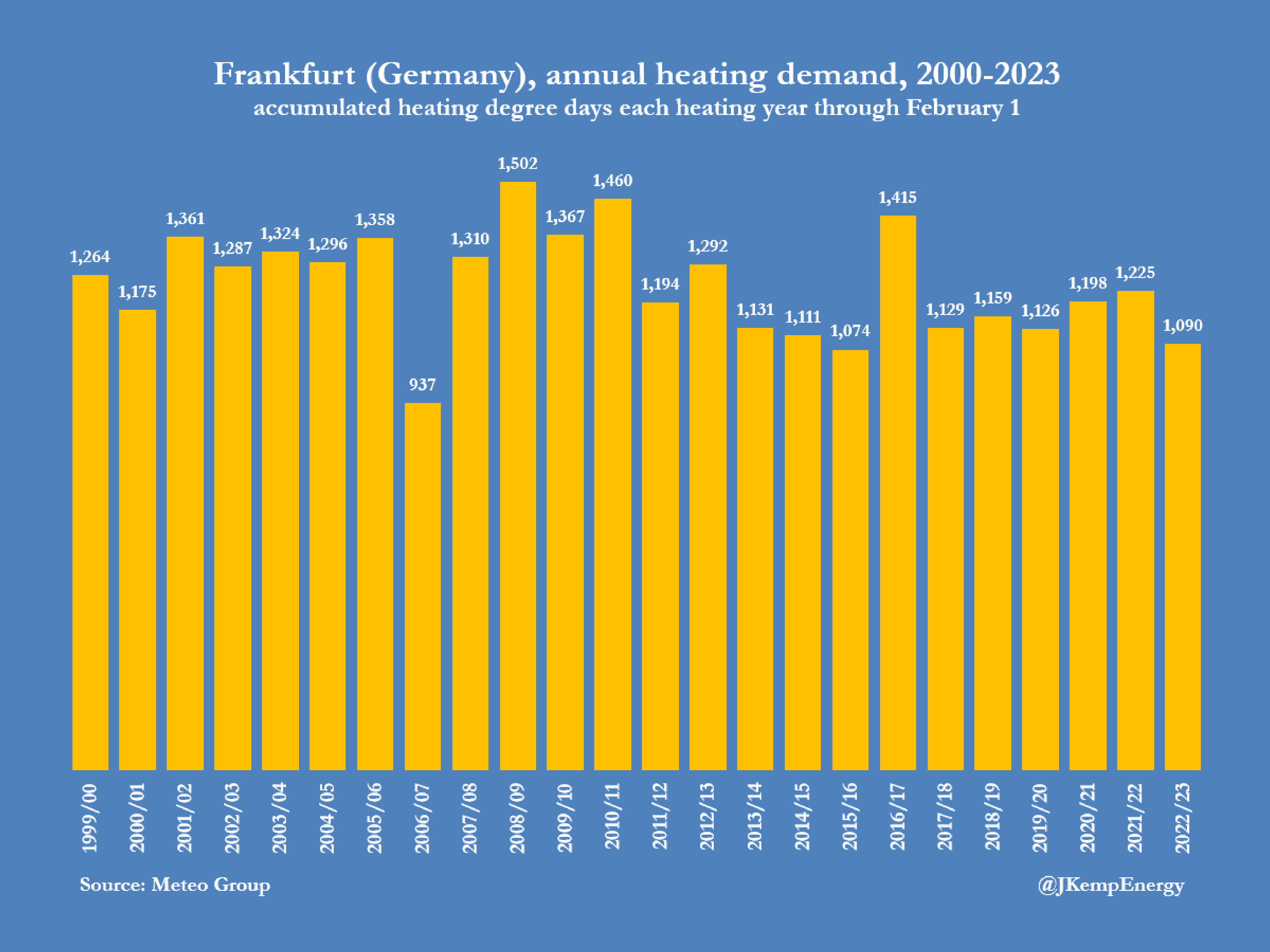
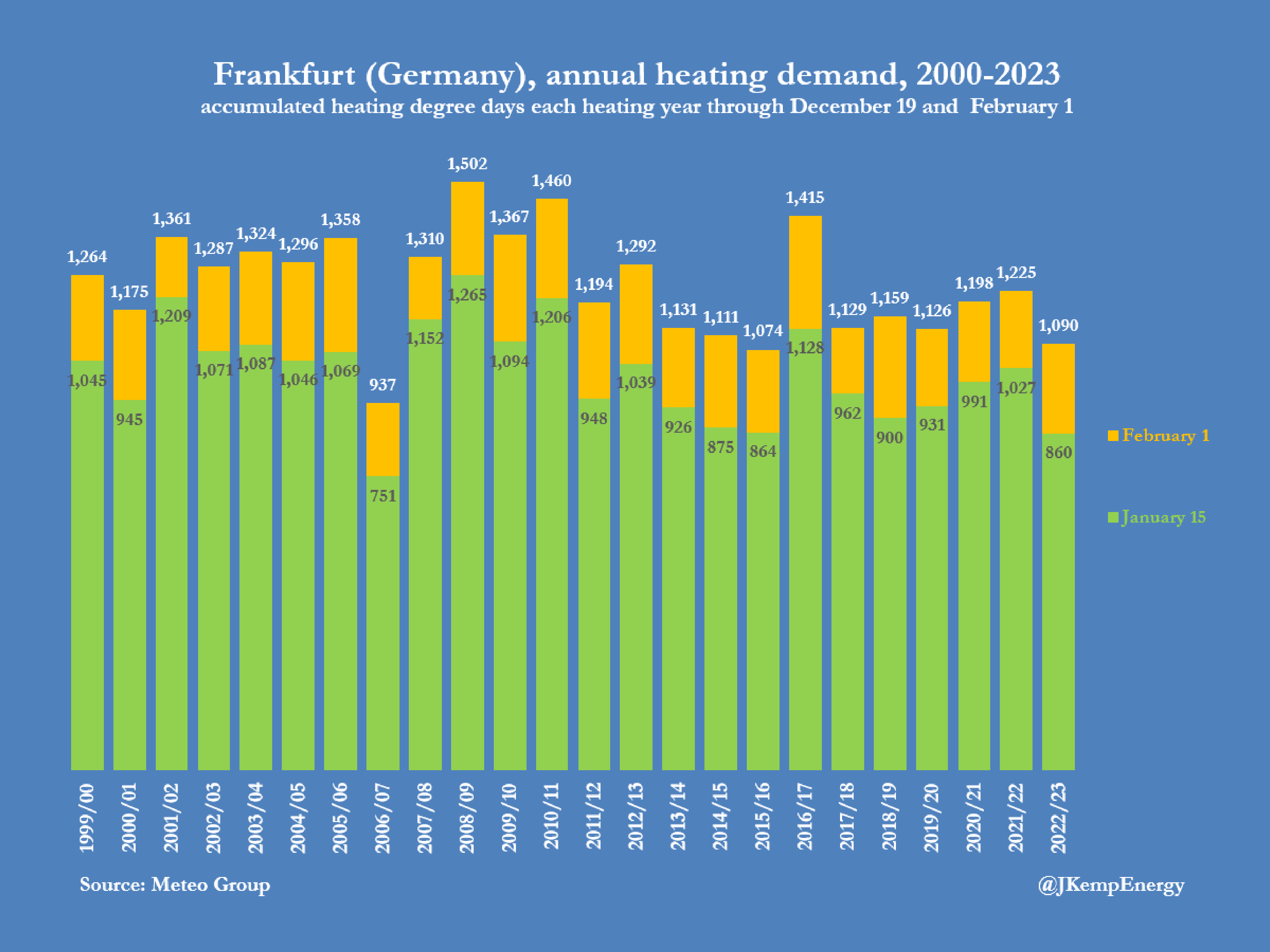


Frankfurt (Germany), annual heating demand, 2000-2023
accumulated heating degree days each heating year through February 1
1,264
1,175
1,361
1,287
1,324
1,296
1,358
937
1,310
1,502
1,367
1,460
1,194
1,292
1,131
1,111
1,074
1,415
1,129
1,159
1,126
1,198
1,225
1,090
1999/00
2000/01
2001/02
2002/03
2003/04
2004/05
2005/06
2006/07
2007/08
2008/09
2009/10
2010/11
2011/12
2012/13
2013/14
2014/15
2015/16
2016/17
2017/18
2018/19
2019/20
2020/21
2021/22
2022/23
Source: Meteo Group
@JKempEnergy


Frankfurt (Germany), annual heating demand, 2000-2023
accumulated heating degree days each heating year through December 19 and February 1
1999/00 1,045 1,264
2000/01 945 1,175
2001/02 1,209 1,361
2002/03 1,071 1,287
2003/04 1,087 1,324
2004/05 1,046 1,296
2005/06 1,069 1,358
2006/07 751 937
2007/08 1,152 1,310
2008/09 1,265 1,502
2009/10 1,094 1,367
2010/11 1,206 1,460
2011/12 948 1,194
2012/13 1,039 1,292
2013/14 926 1,131
2014/15 875 1,111
2015/16 864 1,074
2016/17 1,128 1,415
2017/18 962 1,129
2018/19 900 1,159
2019/20 931 1,126
2020/21 991 1,198
2021/22 1,027 1,225
2022/23 860 1,090
February 1
January 15
Source: Meteo Group
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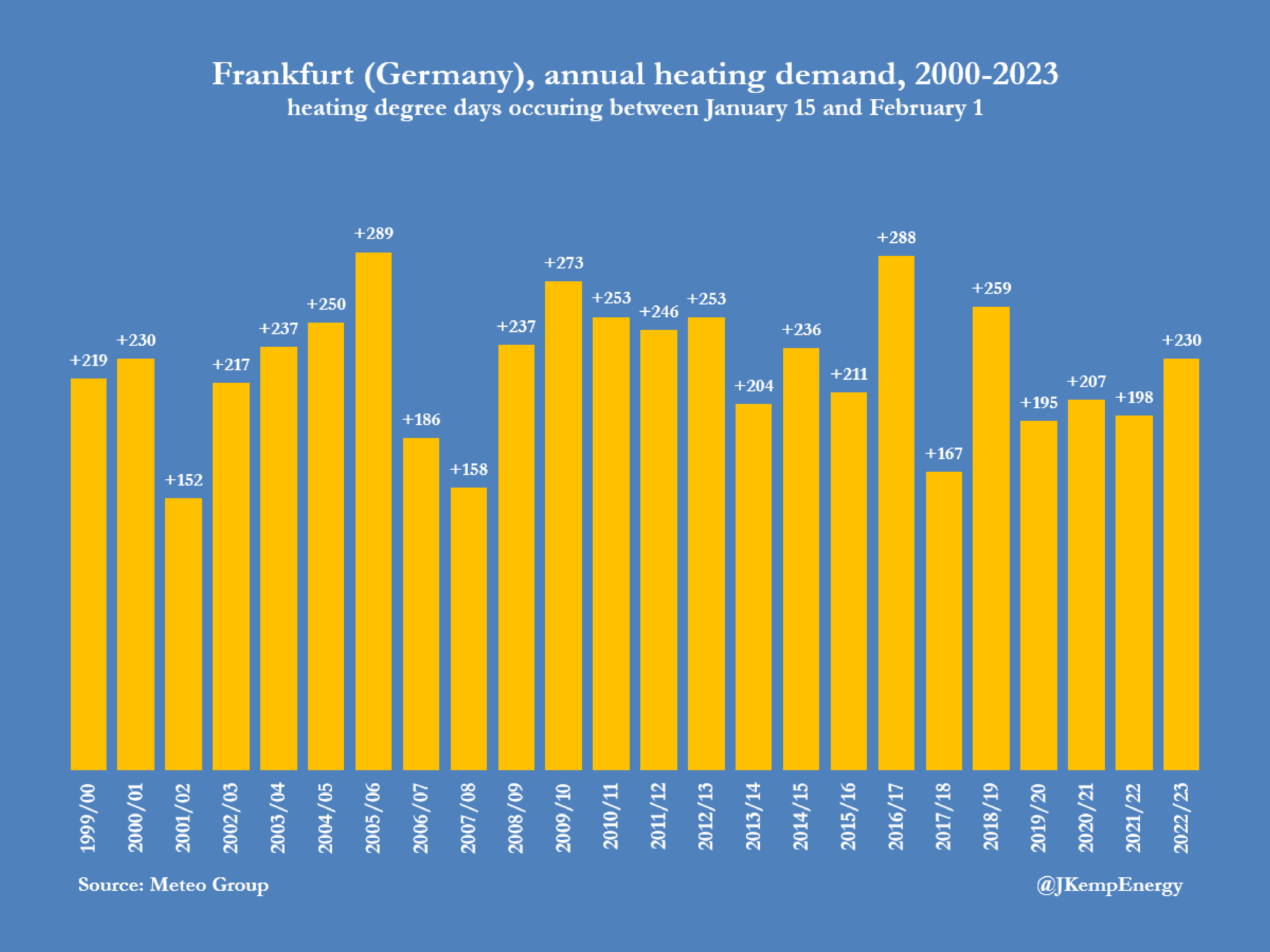
Frankfurt (Germany), annual heating demand, 2000-2023
heating degree days occuring between January 15 and February 1
+219
+230
+152
+217
+237
+250
+289
+186
+158
+237
+273
+253
+246
+253
+204
+236
+211
+288
+167
+259
+195
+207
+198
+230
1999/00
2000/01
2001/02
2002/03
2003/04
2004/05
2005/06
2006/07
2007/08
2008/09
2009/10
2010/11
2011/12
2012/13
2013/14
2014/15
2015/16
2016/17
2017/18
2018/19
2019/20
2020/21
2021/22
2022/23
Source: Meteo Group
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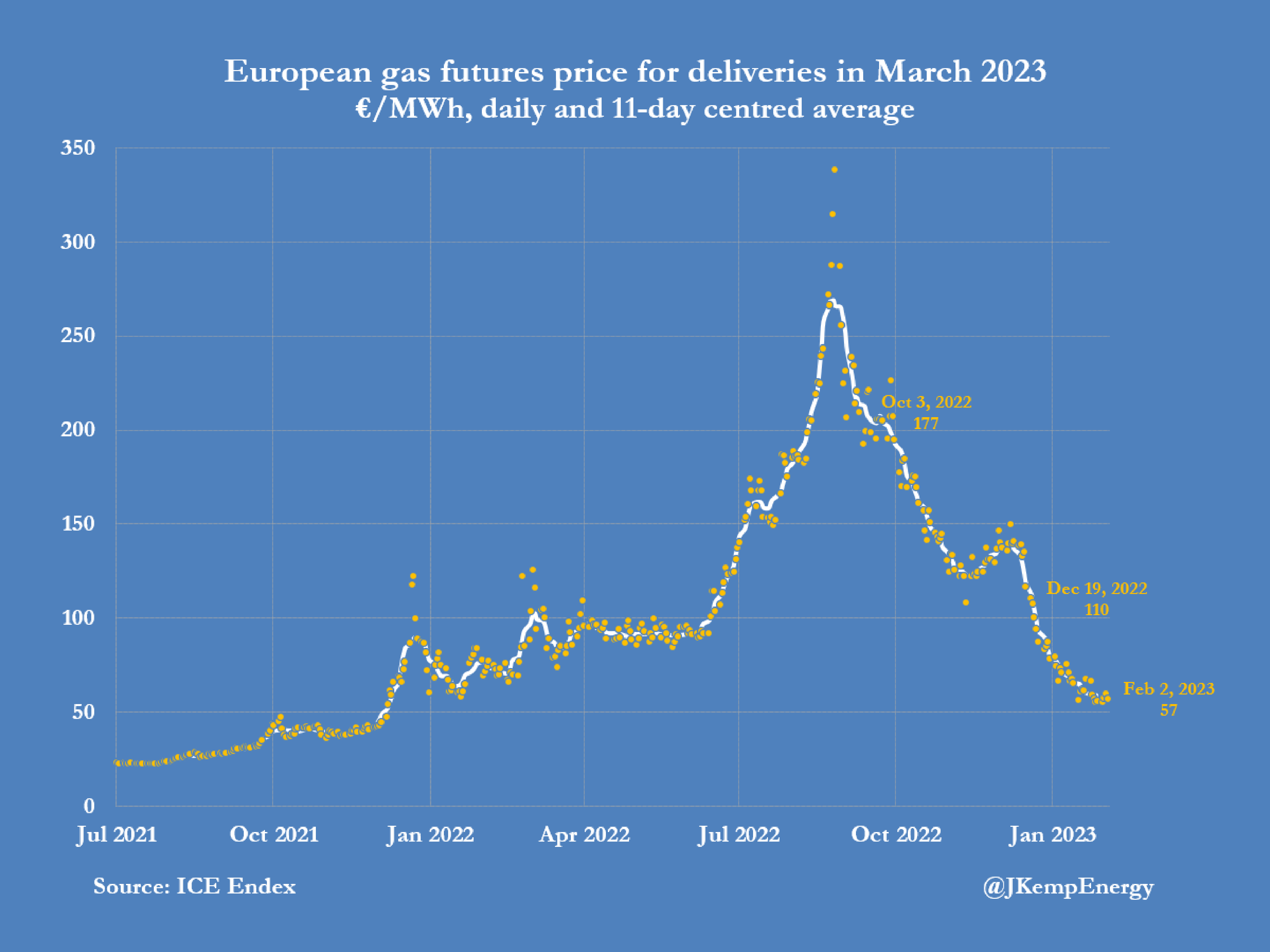
European gas futures price for deliveries in March 2023
€/MWh, daily and 11-day centred average
350
300
250
200
150
100
50
0
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022
Jan 2023
Oct 3, 2022
177
Dec 19, 2022
110
Feb 2, 2023
57
Source: ICE Endex
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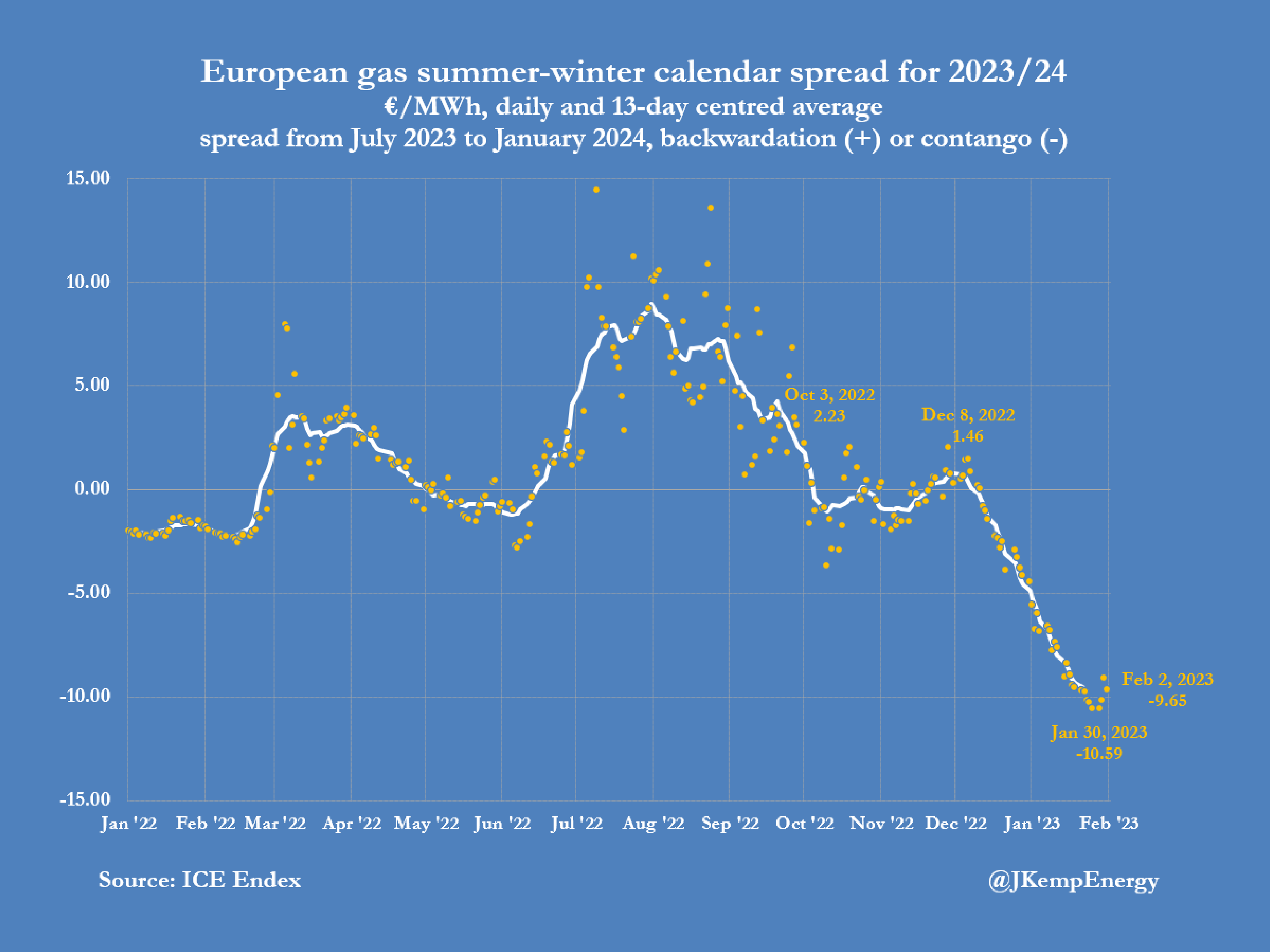

European gas summer-winter calendar spread for 2023/24
€/MWh, daily and 13-day centred average
spread from July 2023 to January 2024, backwardation (+) or contango (-)
15.00
10.00
5.00
0.00
-5.00
-10.00
-15.00
Jan '22
Feb '22
Mar '22
Apr '22
May '22
Jun '22
Jul '22
Aug '22
Sep '22
Oct '22
Nov '22
Dec '22
Jan '23
Feb '23
Oct 3, 2022
2.23
Dec 8, 2022
1.46
Feb 2, 2023
-9.65
Jan 30, 2023
-10.59
Source: ICE Endex
@JKempEnergy