Food and Agriculture
Organization of the
United Nations

World **fertilizer** trends and outlook to **2022**

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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Preface

The Food and Agriculture Organization of the United Nations (FAO) periodically hosts the Fertilizer Outlook Expert Group meeting, to review the medium-term supply and demand prospects for nitrogen, phosphorus and potassium fertilizers and provide world and regional forecasts. The latest meeting of the Expert Group took place on 10-12 September 2018 in Rome, Italy, to prepare forecasts for the period 2017-2022. The results of this meeting are presented in this report.

The Fertilizer Outlook Expert Group currently comprises representatives of:

- The Fertiliser Association of India (FAI)
- Food and Agriculture Organization of the United Nations (FAO)
- International Fertilizer Association (IFA)
- International Fertilizer Development Center (IFDC)
- The Fertilizer Institute (TFI)

The contributions made by the members of the Fertilizer Outlook Expert Group are gratefully acknowledged.

Francesco Tubiello, Javier Montero-Serrano and Fabio Mozillo, from the FAO Statistics Division, provided support by preparing the FAO historical statistics from FAOSTAT and providing assistance during the meeting. This final report was prepared by Debra Turner, FAO Agricultural Officer, under the supervision of Caterina Batello, former FAO Senior Agricultural Officer, and Hans Dreyer, Director of FAO Plant Production and Protection Division, had the overall direction of this publication. Final editing of the document was undertaken by Teodardo Calles, FAO Agricultural Officer.

The forecast data presented in this report are based on the expert views of the different organizations participating in the 2018 Fertilizer Outlook Expert Group meeting. They are not necessarily fully consistent with the FAO historical statistics available in FAOSTAT. The fertilizers data by nutrient available in FAOSTAT can be accessed at http://www.fao.org/faostat/en/#data/RFN and compared with the data for 2016 considered in this report as starting point for the world and regional forecasts.

Technical notes on supply, demand and balances

In this report, fertilizers data are provided with respect to the three primary plant nutrients: nitrogen (N), phosphorus (P) and potassium (K). Data related to each of these nutrients are all expressed in the same units, as follows:

- Nitrogen and ammonia: expressed as N
- Phosphorus and phosphoric acid: expressed as P_2O_5
- Potassium and potash: expressed as K_2O

The fertilizer demand and supply data refer to calendar years. Definitions of the terms used:

Capacity: nameplate capacity.

Supply: effective capacity, representing the maximum achievable production. Supply is computed from the "nameplate capacity" (theoretical capacity), multiplied by the operating rate projected for the period under consideration. For new plants, a ramp up of the operating rates was established for the first 3 years of operation. Nameplate capacity operating rates and demand for fertilizers vary from year to year. In the case of phosphorus, the supply data in this report are restricted to phosphoric acid (H_3PO_4).

Demand: it can be split into fertilizer use and other uses.

Demand for fertilizer use is the use of fertilizer at a given point in time. In the case of phosphorus, fertilizer demand is subdivided in this report into phosphoric acid based fertilizer demand and non-phosphoric acid fertilizer demand. The non-phosphoric acid fertilizer demand includes phosphorus in single super phosphate, rock phosphate, etc.

Demand for other uses refers to consumption for non-fertilizer use, losses and unallocated demand. In this report it refers to all forms of demand excluding fertilizer and includes the use of nutrients (N, P or K) that are recovered as by-product from industrial processes and then used as fertilizer.

Potential balance: is the difference between supply and total demand (fertilizer demand plus other uses demand). Regional balance is a medium-term indicator of potential changes in fertilizer nutrient demand and supply in the region.

The world fertilizer **outlook**

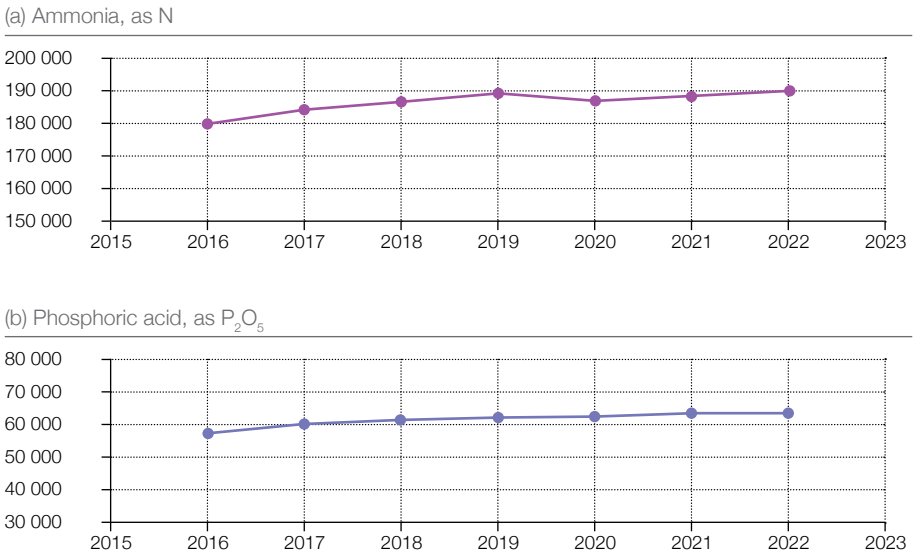
SUPPLY

Forecasts of world capacity for producing ammonia, phosphoric acid and potash, up to 2022, are provided in table 1 (and figure 1). Forecasts of world supply are provided in table 2 (and figure 2). Regional and sub-regional forecasts are provided in annexes 1, 2 and 3.

Table 1. World capacity for producing ammonia, phosphoric acid and potash, 2016-2022 (thousand tonnes)

Year	2016	2017	2018	2019	2020	2021	2022
Ammonia, as N	180 496	184 558	186 974	189 523	187 354	188 908	190 397
Phosphoric acid, as P_2O_5	57 295	60 224	61 464	62 357	62 612	63 552	63 702
Potash, as K_2O	54 638	58 455	61 951	62 055	63 467	63 513	64 553
Total ($N+P_2O_5+K_2O$)	**292 429**	**303 237**	**310 389**	**313 935**	**313 433**	**315 973**	**318 652**

Figure 1. World capacity for producing (a) ammonia, (b) phosphoric acid and (c) potash, 2016-2022 (thousand tonnes)



(c) Potash, as K_2O

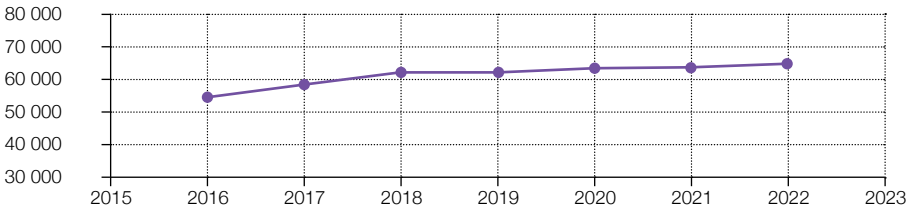
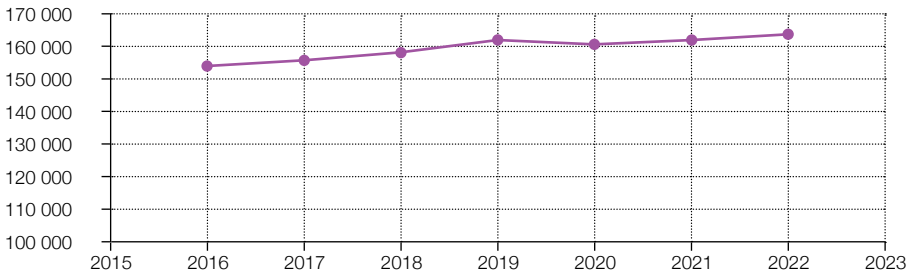


Table 2. World supply of ammonia, phosphoric acid and potash, 2016-2022 (thousand tonnes)

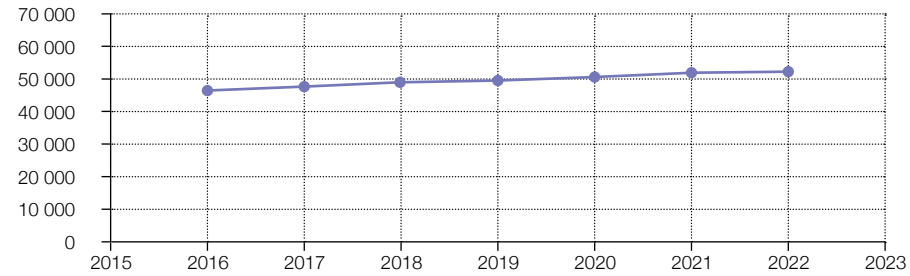
Year	2016	2017	2018	2019	2020	2021	2022
Ammonia, as N	153 646	155 253	157 819	161 504	160 492	161 572	163 219
Phosphoric acid, as P_2O_5	46 308	47 564	48 620	49 510	50 520	51 520	52 066
Potash, as K_2O	44 177	46 284	49 422	51 373	52 752	53 664	54 197
Total ($N+P_2O_5+K_2O$)	**244 131**	**249 101**	**255 861**	**262 387**	**263 764**	**266 756**	**269 482**

Figure 2. World supply of (a) ammonia, (b) phosphoric acid and (c) potash, 2016-2022 (thousand tonnes)

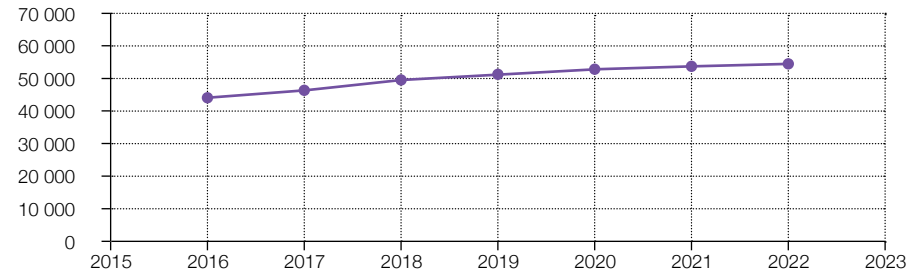
(a) Ammonia, as N



(b) Phosphoric acid, as P_2O_5



(c) Potash, as K_2O



DEMAND

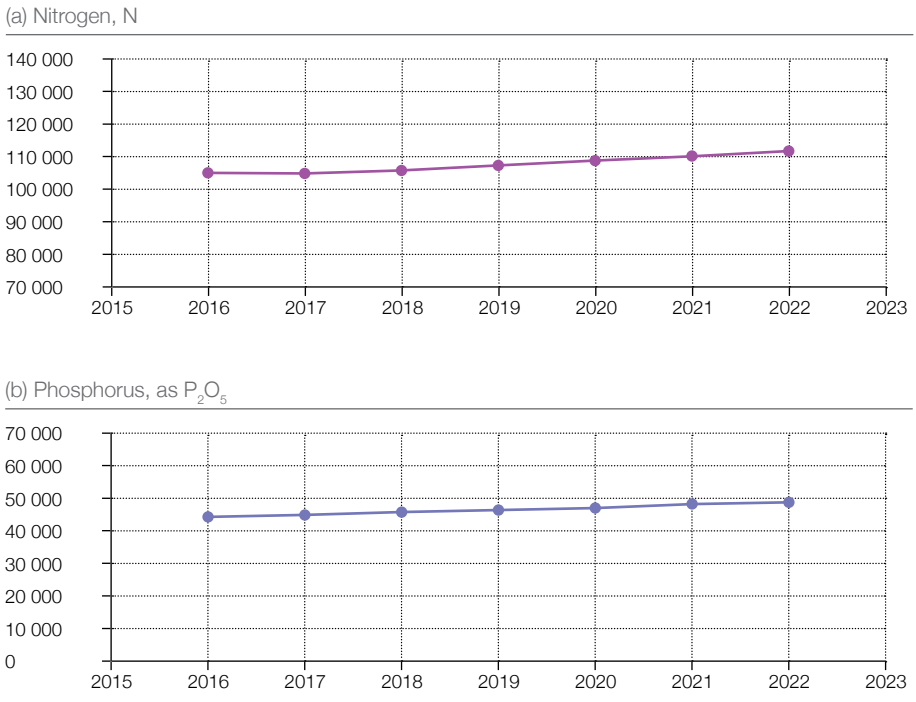
Demand for fertilizer use

Forecasts of world demand for nitrogen, phosphorus and potassium for fertilizer use, up to 2022, are provided in table 3 (and figure 3). Regional and sub-regional forecasts are provided in annexes 1, 2 and 3.

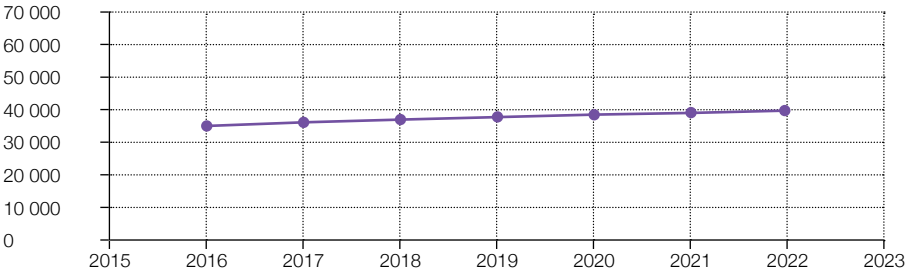
Table 3. World demand for nitrogen, phosphorus and potassium for fertilizer use, 2016-2022 (thousand tonnes)

Year	2016	2017	2018	2019	2020	2021	2022
Nitrogen, N	105 148	105 050	105 893	107 424	108 744	110 193	111 591
Phosphorus, as P_2O_5	44 481	45 152	45 902	46 587	47 402	48 264	49 096
Potassium, as K_2O	35 434	36 349	37 171	37 971	38 711	39 473	40 232
Total ($N+P_2O_5+K_2O$)	**185 063**	**186 551**	**188 966**	**191 981**	**194 857**	**197 930**	**200 919**

Figure 3. World demand for (a) nitrogen, (b) phosphorus and (c) potassium, for fertilizer use, 2016-2022 (thousand tonnes)



(c) Potassium, as K_2O



Demand for other uses

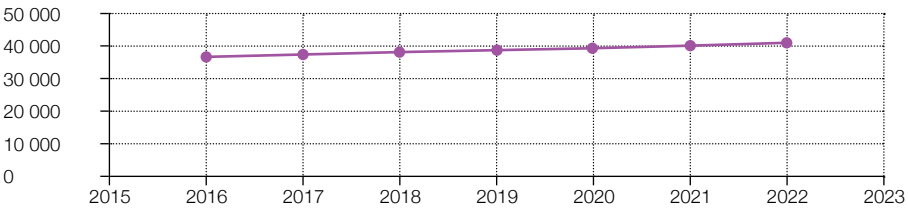
Forecasts of world demand for nitrogen, phosphorus and potassium for other uses, up to 2022, are provided in table 4 (and figure 4). Regional and sub-regional forecasts are provided in annexes 1, 2 and 3.

Table 4. World demand for nitrogen, phosphorus (phosphoric acid based) and potassium for other uses, 2016-2022 (thousand tonnes)

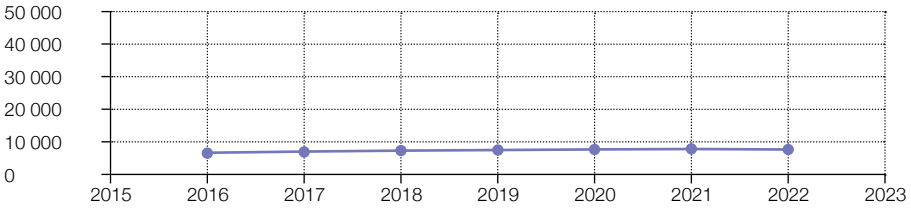
Year	2015	2016	2016	2017	2018	2019	2020
Nitrogen, N	36 930	37 663	38 320	38 965	39 569	40 127	40 660
Phosphorus (phos. acid based), as P_2O_5	6 444	6 677	7 036	7 170	7 291	7 482	7 734
Potassium, as K_2O	5 572	5 752	5 876	5 993	6 112	6 237	6 363
Total ($N+P_2O_5+K_2O$)	**48 946**	**50 092**	**51 232**	**52 128**	**52 972**	**53 846**	**54 757**

Figure 4. World demand for (a) nitrogen, (b) phosphorus (phosphoric acid based) and (c) potassium, for other uses, 2016-2022 (thousand tonnes)

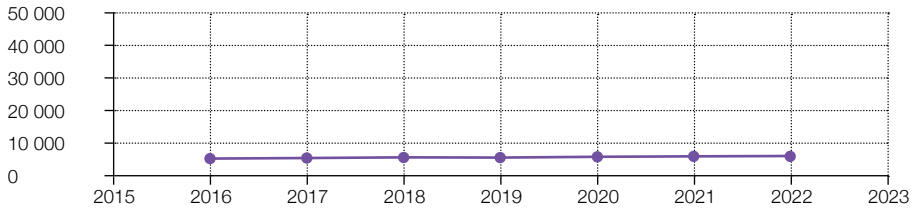
(a) Nitrogen, N



(b) Phosphorus (phosphoric acid based), as P_2O_5



(c) Potassium, as K_2O



SUPPLY AND DEMAND BALANCES

The potential balance of nitrogen, phosphorus and potassium is calculated as maximum achievable production (supply) minus total demand (including fertilizer and other uses):

Potential balance = supply – (fertilizer uses + other uses demand)
where supply of each nutrient refers to:

- Ammonia, for nitrogen
- Phosphoric acid, for phosphorus
- Potash, for potassium

Given that phosphorus supply data in this report are restricted to phosphoric acid (H_3PO_4), the demand considered in the balance is also restricted to phosphoric acid-based fertilizer demand. These data are available in annex 2.

Unforeseeable factors, such as feedstock and/or raw material limitations, logistical problems, unscheduled shut down due to technical reasons, natural calamities (for example, earthquakes, mine flooding) are not considered in the balance. Demand projections are based on agronomic considerations (for example, cropped area and application rate of fertilizer), market feedback, estimates by industry associations, growth models, econometric models and expert judgement.

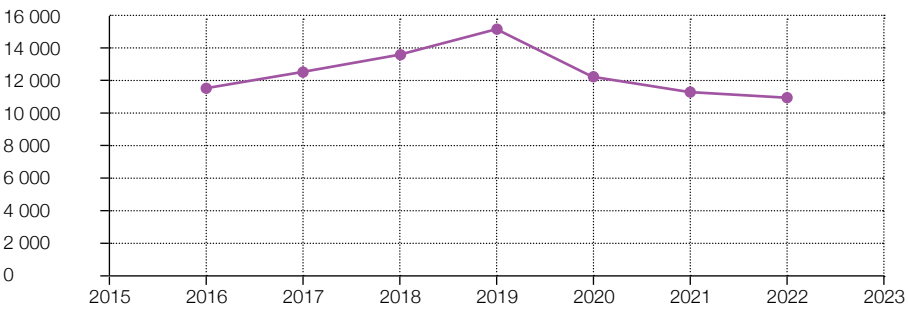
Forecasts of potential world balances of nitrogen, phosphorus and potassium, up to 2022, are provided in table 5. Regional and sub-regional forecasts are provided in annexes 1, 2 and 3. Figure 5 indicates the potential balances by region in 2022, the final year of the forecast period.

Table 5. Potential world balance of nitrogen, phosphorus and potassium, 2016-2022 (thousand tonnes)

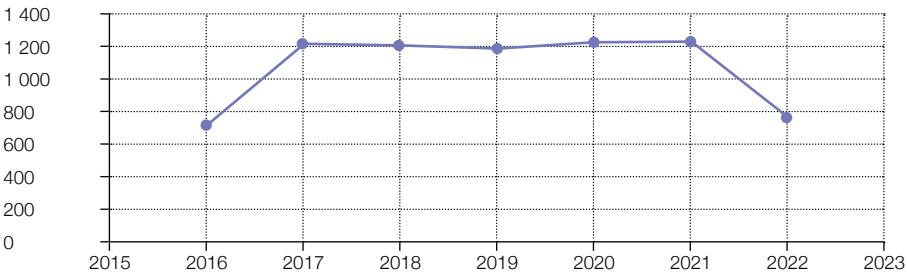
Year	2016	2017	2018	2019	2020	2021	2022
Nitrogen, N	11 568	12 540	13 606	15 115	12 179	11 252	10 968
Phosphorus (phos. acid based), as P_2O_5	728	1 223	1 217	1 191	1 231	1 238	771
Potassium, as K_2O	3 171	4 183	6 375	7 409	7 929	7 954	7 602
Total ($N+P_2O_5+K_2O$)	**15 467**	**17 946**	**21 197**	**23 716**	**21 339**	**20 445**	**19 341**

Figure 5. Potential world balance of (a) nitrogen, (b) phosphorus and (c) potassium, 2016-2022 (thousand tonnes)

(a) Nitrogen, N



(b) Phosphorus, as P_2O_5



(c) Potassium, as K_2O

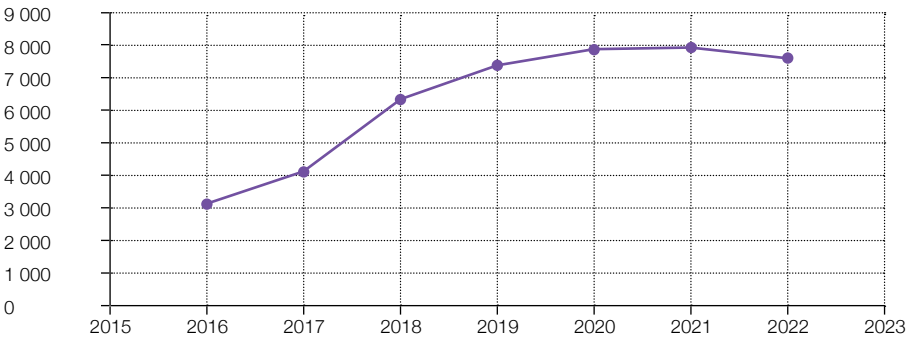
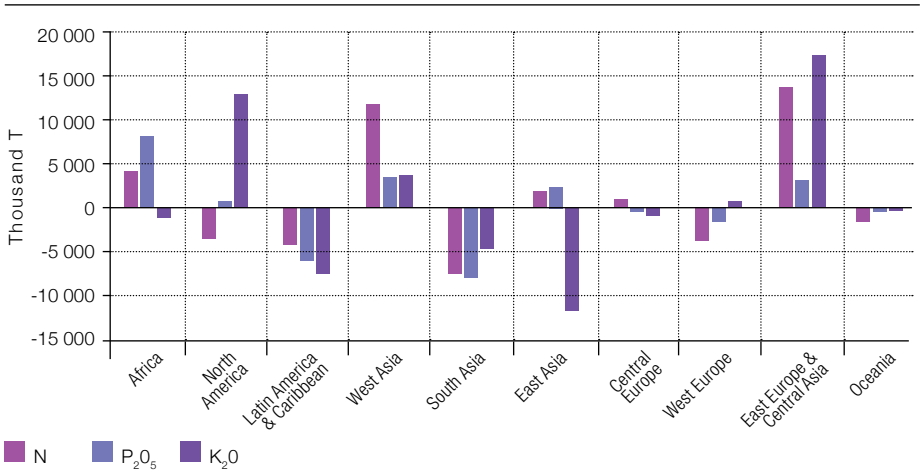


Figure 6. Potential balance of nitrogen, phosphorus and potassium in 2022, by region (thousand tonnes)



Annexes

Annex 1
World and regional nitrogen supply, demand and balance 2016-2022 (thousand tonnes N)

	2016	2017	2018	2019	2020	2021	2022
WORLD							
Ammonia - capacity	180 496	184 558	186 974	189 523	187 354	188 908	190 397
Ammonia - supply capability	153 646	155 253	157 819	161 504	160 492	161 572	163 219
Nitrogen - other uses	36 930	37 663	38 320	38 965	39 569	40 127	40 660
Nitrogen - available for fertilizers	116 716	117 590	119 499	122 539	120 923	121 445	122 559
Nitrogen - fertilizer demand	105 148	105 050	105 893	107 424	108 744	110 193	111 591
Nitrogen - potential balance	11 568	12 540	13 606	15 115	12 179	11 252	10 968
AFRICA							
Ammonia - capacity	9 458	9 458	10 055	10 651	10 869	11 763	11 763
Ammonia - supply capability	6 476	7 680	7 829	8 247	8 717	9 126	9 549
Nitrogen - other uses	563	576	588	601	614	626	638
Nitrogen - available for fertilizers	5 913	7 104	7 241	7 646	8 103	8 500	8 911
Nitrogen - fertilizer demand	4 014	4 165	4 306	4 468	4 515	4 760	5 008
Nitrogen - potential balance	1 899	2 939	2 935	3 178	3 588	3 740	3 903
AMERICAS							
Ammonia - capacity	26 069	27 817	28 745	28 444	28 444	28 444	28 444
Ammonia - supply capability	22 622	24 018	24 706	24 927	25 318	25 478	25 591
Nitrogen - other uses	7 669	7 744	7 892	8 026	8 124	8 206	8 272
Nitrogen - available for fertilizers	14 953	16 274	16 814	16 901	17 194	17 272	17 319
Nitrogen - fertilizer demand	23 443	23 295	23 673	24 029	24 354	24 698	25 043
Nitrogen - potential balance	-8 490	-7 021	-6 859	-7 128	-7 160	-7 426	-7 724

Table follows in the next page >>

	2016	2017	2018	2019	2020	2021	2022
North America							
Ammonia - capacity	16 393	17 816	18 432	18 432	18 432	18 432	18 432
Ammonia - supply capability	14 973	16 104	17 229	17 354	17 511	17 651	17 764
Nitrogen - other uses	6 200	6 218	6 300	6 382	6 444	6 506	6 563
Nitrogen - available for fertilizers	8 773	9 886	10 929	10 972	11 067	11 145	11 201
Nitrogen - fertilizer demand	14 287	14 110	14 353	14 478	14 563	14 663	14 765
Nitrogen - potential balance	-5 514	-4 224	-3 424	-3 506	-3 496	-3 518	-3 564
Latin America & Caribbean							
Ammonia - capacity	9 676	10 001	10 313	10 012	10 012	10 012	10 012
Ammonia - supply capability	7 649	7 914	7 477	7 573	7 807	7 827	7 827
Nitrogen - other uses	1 469	1 526	1 592	1 644	1 680	1 700	1 709
Nitrogen - available for fertilizers	6 180	6 388	5 885	5 929	6 127	6 127	6 118
Nitrogen - fertilizer demand	9 157	9 185	9 320	9 552	9 791	10 035	10 279
Nitrogen - potential balance	-2 977	-2 797	-3 435	-3 623	-3 664	-3 908	-4 161
ASIA							
Ammonia - capacity	102 152	103 416	104 113	105 472	102 972	103 346	104 755
Ammonia - supply capability	88 229	87 675	88 138	89 968	87 751	87 913	88 947
Nitrogen - other uses	18 913	19 404	19 687	20 038	20 384	20 719	21 054
Nitrogen - available for fertilizers	69 316	68 271	68 451	69 930	67 367	67 194	67 893
Nitrogen - fertilizer demand	59 244	58 778	59 213	59 995	60 708	61 364	61 976
Nitrogen - potential balance	10 072	9 493	9 238	9 935	6 659	5 830	5 917
West Asia							
Ammonia - capacity	15 095	16 549	16 543	16 580	16 580	16 851	16 851
Ammonia - supply capability	14 323	15 347	15 379	15 452	15 562	15 724	15 904
Nitrogen - other uses	874	1 019	955	979	999	1 011	1 022
Nitrogen - available for fertilizers	13 449	14 328	14 424	14 473	14 563	14 713	14 882
Nitrogen - fertilizer demand	3 186	3 044	3 041	3 143	3 207	3 273	3 341
Nitrogen - potential balance	10 263	11 284	11 383	11 330	11 356	11 440	11 541

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	2016	2017	2018	2019	2020	2021	2022
South Asia							
Ammonia - capacity	17 493	18 102	18 102	19 311	19 311	19 908	21 102
Ammonia - supply capability	15 625	15 823	16 173	17 173	17 292	17 770	18 666
Nitrogen - other uses	1 751	1 762	1 776	1 790	1 805	1 820	1 835
Nitrogen - available for fertilizers	13 874	14 061	14 397	15 383	15 487	15 950	16 831
Nitrogen - fertilizer demand	21 497	22 082	22 350	22 866	23 348	23 821	24 258
Nitrogen - potential balance	-7 623	-8 021	-7 953	-7 483	-7 861	-7 871	-7 427
East Asia							
Ammonia - capacity	69 564	68 765	69 468	69 581	67 081	66 587	66 802
Ammonia - supply capability	58 281	56 505	56 586	57 343	54 897	54 419	54 377
Nitrogen - other uses	16 288	16 623	16 956	17 269	17 580	17 888	18 197
Nitrogen - available for fertilizers	41 993	39 882	39 630	40 074	37 317	36 531	36 180
Nitrogen - fertilizer demand	34 560	33 653	33 822	33 985	34 153	34 270	34 378
Nitrogen - potential balance	7 433	6 229	5 808	6 089	3 164	2 261	1 802
EUROPE							
Ammonia - capacity	40 977	42 027	42 215	43 110	43 223	43 509	43 589
Ammonia - supply capability	34 815	34 376	35 635	36 851	37 195	37 544	37 621
Nitrogen - other uses	8 842	8 984	9 158	9 278	9 396	9 496	9 595
Nitrogen - available for fertilizers	25 973	25 392	26 477	27 573	27 799	28 048	28 026
Nitrogen - fertilizer demand	16 496	16 858	16 854	17 017	17 211	17 374	17 552
Nitrogen - potential balance	9 477	8 535	9 623	10 557	10 588	10 675	10 474
Central Europe							
Ammonia - capacity	6 793	6 888	5 926	5 926	5 926	5 926	5 926
Ammonia - supply capability	4 820	4 908	5 104	5 112	5 112	5 112	5 112
Nitrogen - other uses	887	914	936	951	964	976	988
Nitrogen - available for fertilizers	3 933	3 994	4 168	4 161	4 148	4 136	4 124
Nitrogen - fertilizer demand	3 067	3 106	3 139	3 160	3 207	3 267	3 344
Nitrogen - potential balance	866	888	1 029	1 001	941	869	780

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	2016	2017	2018	2019	2020	2021	2022
West Europe							
Ammonia - capacity	9 876	9 894	10 088	10 088	10 088	10 088	10 088
Ammonia - supply capability	9 774	9 855	10 058	10 058	10 058	10 058	10 059
Nitrogen - other uses	5 439	5 533	5 608	5 663	5 716	5 761	5 810
Nitrogen - available for fertilizers	4 335	4 322	4 450	4 395	4 342	4 297	4 249
Nitrogen - fertilizer demand	8 372	8 343	8 216	8 165	8 116	8 069	8 017
Nitrogen - potential balance	-4 037	-4 021	-3 766	-3 770	-3 774	-3 772	-3 768
East Europe and Central Asia							
Ammonia - capacity	24 308	25 245	26 201	27 096	27 209	27 495	27 575
Ammonia - supply capability	20 221	19 613	20 473	21 681	22 025	22 374	22 450
Nitrogen - other uses	2 516	2 537	2 614	2 664	2 716	2 759	2 797
Nitrogen - available for fertilizers	17 705	17 076	17 859	19 017	19 309	19 615	19 653
Nitrogen - fertilizer demand	5 057	5 408	5 500	5 691	5 888	6 038	6 191
Nitrogen - potential balance	12 648	11 668	12 359	13 326	13 421	13 577	13 462
OCEANIA							
Ammonia - capacity	1 840	1 840	1 846	1 846	1 846	1 846	1 846
Ammonia - supply capability	1 504	1 504	1 511	1 511	1 511	1 511	1 511
Nitrogen - other uses	943	955	995	1 022	1 051	1 080	1 101
Nitrogen - available for fertilizers	561	549	516	489	460	431	410
Nitrogen - fertilizer demand	1 951	1 954	1 847	1 915	1 956	1 997	2 011
Nitrogen - potential balance	-1 390	-1 405	-1 331	-1 426	-1 496	-1 566	-1 601

Annex 2
World and regional phosphorus supply, demand and balance 2016-2022 (thousand tonnes P_2O_5)

	2016	2017	2018	2019	2020	2021	2022
WORLD							
Posphoric acid - capacity	57 295	60 224	61 464	62 357	62 612	63 552	63 702
Phosphoric acid - supply capability	46 308	47 564	48 620	49 510	50 520	51 520	52 066
Posphoric acid - other uses	6 444	6 677	7 036	7 170	7 291	7 482	7 734
Phos. acid - available for fertilizer	39 864	40 887	41 584	42 340	43 229	44 038	44 332
Phosphorus - fertilizer demand	44 481	45 152	45 902	46 587	47 402	48 264	49 096
Phos. acid - fertilizer demand	39 136	39 664	40 368	41 149	41 999	42 799	43 562
Non-phos. acid - fertilizer demand	5 345	5 488	5 534	5 438	5 403	5 465	5 534
Phosphoric acid -potential balance	728	1 223	1 217	1 191	1 231	1 238	771
AFRICA							
Posphoric acid - capacity	9 628	10 328	11 378	12 038	12 538	13 038	13 038
Phosphoric acid - supply capability	7 424	7 751	8 248	8 905	9 505	10 125	10 447
Posphoric acid - other uses	574	612	671	672	674	748	823
Phos. acid - available for fertilizer	6 850	7 139	7 577	8 233	8 831	9 377	9 624
Phosphorus - fertilizer demand	1 676	1 827	1 942	2 030	2 114	2 194	2 274
Phos. acid - fertilizer demand	1 307	1 425	1 515	1 583	1 649	1 711	1 774
Non-phos. acid - fertilizer demand	369	402	427	447	465	483	500
Phosphoric acid -potential balance	5 543	5 714	6 062	6 650	7 182	7 666	7 850

Table follows in the next page >>

	2016	2017	2018	2019	2020	2021	2022
AMERICAS							
Posphoric acid - capacity	11 528	11 528	11 528	11 526	11 181	11 181	11 181
Phosphoric acid - supply capability	9 791	9 791	8 942	8 670	8 778	8 778	8 778
Posphoric acid - other uses	1 974	1 971	1 988	2 011	2 014	2 018	2 095
Phos. acid - available for fertilizer	7 817	7 820	6 954	6 659	6 764	6 760	6 683
Phosphorus - fertilizer demand	12 121	12 237	12 488	12 713	12 932	13 165	13 387
Phos. acid - fertilizer demand	10 912	11 010	11 312	11 508	11 698	11 901	12 092
Non-phos. acid - fertilizer demand	1 209	1 226	1 177	1 205	1 234	1 265	1 295
Phosphoric acid -potential balance	-3 095	-3 190	-4 358	-4 849	-4 934	-5 141	-5 409
North America							
Posphoric acid - capacity	8 836	8 836	8 836	8 634	8 289	8 289	8 289
Phosphoric acid - supply capability	7 970	7 970	7 121	6 769	6 797	6 797	6 797
Posphoric acid - other uses	905	925	920	921	921	922	922
Phos. acid - available for fertilizer	7 065	7 045	6 201	5 848	5 876	5 875	5 875
Phosphorus - fertilizer demand	5 007	5 023	5 135	5 183	5 220	5 261	5 294
Phos. acid - fertilizer demand	5 007	5 023	5 135	5 183	5 220	5 261	5 294
Non-phos. acid - fertilizer demand	0	0	0	0	0	0	0
Phosphoric acid -potential balance	2 058	2 022	1 066	665	656	614	581
Latin America & Caribbean							
Posphoric acid - capacity	2 692	2 692	2 692	2 892	2 892	2 892	2 892
Phosphoric acid - supply capability	1 821	1 821	1 821	1 901	1 981	1 981	1 981
Posphoric acid - other uses	1 069	1 046	1 068	1 090	1 093	1 096	1 173
Phos. acid - available for fertilizer	752	775	753	811	888	885	808
Phosphorus - fertilizer demand	7 114	7 213	7 353	7 530	7 712	7 904	8 094
Phos. acid - fertilizer demand	5 905	5 987	6 177	6 325	6 478	6 640	6 799
Non-phos. acid - fertilizer demand	1 209	1 226	1 177	1 205	1 234	1 265	1 295
Phosphoric acid -potential balance	-5 153	-5 212	-5 424	-5 514	-5 590	-5 755	-5 991

Table follows in the next page >>

	2016	2017	2018	2019	2020	2021	2022
ASIA							
Posphoric acid - capacity	29 474	31 344	31 394	31 794	31 894	32 094	32 244
Phosphoric acid - supply capability	23 639	24 149	25 459	25 911	26 213	26 521	26 673
Posphoric acid - other uses	2 951	3 101	3 232	3 341	3 455	3 568	3 666
Phos. acid - available for fertilizer	20 688	21 048	22 227	22 570	22 758	22 953	23 007
Phosphorus - fertilizer demand	25 445	25 719	26 100	26 357	26 774	27 217	27 662
Phos. acid - fertilizer demand	22 810	23 025	23 264	23 691	24 210	24 660	25 099
Non-phos. acid - fertilizer demand	2 636	2 693	2 837	2 666	2 564	2 558	2 563
Phosphoric acid -potential balance	-2 122	-1 978	-1 037	-1 121	-1 452	-1 707	-2 092
West Asia							
Posphoric acid - capacity	3 932	5 432	5 432	5 632	5 632	5 632	5 632
Phosphoric acid - supply capability	3 258	3 566	4 286	4 622	4 794	4 936	4 964
Posphoric acid - other uses	383	466	546	546	546	653	653
Phos. acid - available for fertilizer	2 875	3 100	3 740	4 076	4 248	4 283	4 311
Phosphorus - fertilizer demand	1 148	1 104	1 091	1 072	1 065	1 059	1 054
Phos. acid - fertilizer demand	1 114	1 072	1 060	1 041	1 034	1 029	1 023
Non-phos. acid - fertilizer demand	34	32	32	31	31	31	31
Phosphoric acid -potential balance	1 761	2 028	2 680	3 035	3 214	3 254	3 288
South Asia							
Posphoric acid - capacity	2 347	2 347	2 347	2 447	2 447	2 447	2 447
Phosphoric acid - supply capability	1 853	1 857	1 857	1 890	1 937	1 937	1 937
Posphoric acid - other uses	247	251	254	259	270	275	280
Phos. acid - available for fertilizer	1 606	1 606	1 603	1 631	1 667	1 662	1 657
Phosphorus - fertilizer demand	8 586	8 801	9 118	9 323	9 690	10 071	10 457
Phos. acid - fertilizer demand	7 556	7 745	8 115	8 391	8 818	9 165	9 516
Non-phos. acid - fertilizer demand	1 030	1 056	1 003	932	872	906	941
Phosphoric acid -potential balance	-5 950	-6 139	-6 512	-6 760	-7 151	-7 503	-7 859

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	2016	2017	2018	2019	2020	2021	2022
East Asia							
Posphoric acid - capacity	23 195	23 565	23 615	23 715	23 815	24 015	24 165
Phosphoric acid - supply capability	18 528	18 726	19 316	19 399	19 482	19 648	19 772
Posphoric acid - other uses	2 321	2 384	2 432	2 536	2 639	2 640	2 733
Phos. acid - available for fertilizer	16 207	16 342	16 884	16 863	16 843	17 008	17 039
Phosphorus - fertilizer demand	15 711	15 814	15 891	15 962	16 019	16 087	16 151
Phos. acid - fertilizer demand	14 140	14 209	14 089	14 259	14 358	14 466	14 559
Non-phos. acid - fertilizer demand	1 571	1 605	1 802	1 702	1 661	1 620	1 592
Phosphoric acid -potential balance	2 067	2 133	2 795	2 603	2 485	2 542	2 480
EUROPE							
Posphoric acid - capacity	6 065	6 424	6 564	6 399	6 399	6 639	6 639
Phosphoric acid - supply capability	4 974	5 393	5 491	5 544	5 544	5 616	5 688
Posphoric acid - other uses	928	973	1 126	1 127	1 128	1 129	1 131
Phos. acid - available for fertilizer	4 046	4 420	4 365	4 417	4 416	4 487	4 557
Phosphorus - fertilizer demand	4 030	4 048	4 089	4 180	4 262	4 355	4 435
Phos. acid - fertilizer demand	3 238	3 252	3 341	3 412	3 478	3 555	3 620
Non-phos. acid - fertilizer demand	793	796	748	768	784	800	815
Phosphoric acid -potential balance	808	1 168	1 024	1 005	938	932	937
Central Europe							
Posphoric acid - capacity	844	844	844	679	679	679	679
Phosphoric acid - supply capability	486	531	531	531	531	531	531
Posphoric acid - other uses	156	162	163	163	163	164	165
Phos. acid - available for fertilizer	330	369	368	368	368	367	366
Phosphorus - fertilizer demand	793	817	827	843	868	908	940
Phos. acid - fertilizer demand	753	776	786	801	825	863	893
Non-phos. acid - fertilizer demand	40	41	41	42	43	45	47
Phosphoric acid -potential balance	-423	-407	-417	-433	-457	-496	-526

Table follows in the next page >>

	2016	2017	2018	2019	2020	2021	2022
West Europe							
Posphoric acid - capacity	565	565	565	565	565	565	565
Phosphoric acid - supply capability	478	506	506	506	506	506	506
Posphoric acid - other uses	517	547	577	577	577	577	577
Phos. acid - available for fertilizer	-39	-41	-71	-71	-71	-71	-71
Phosphorus - fertilizer demand	1 820	1 784	1 771	1 774	1 772	1 769	1 766
Phos. acid - fertilizer demand	1 492	1 463	1 452	1 454	1 453	1 451	1 448
Non-phos. acid - fertilizer demand	328	321	319	319	319	318	318
Phosphoric acid -potential balance	-1 531	-1 504	-1 523	-1 525	-1 524	-1 522	-1 519
East Europe and Central Asia							
Posphoric acid - capacity	4 656	5 015	5 155	5 155	5 155	5 395	5 395
Phosphoric acid - supply capability	4 010	4 356	4 454	4 507	4 507	4 579	4 651
Posphoric acid - other uses	255	264	386	387	388	388	389
Phos. acid - available for fertilizer	3 755	4 092	4 068	4 120	4 119	4 191	4 262
Phosphorus - fertilizer demand	1 418	1 447	1 490	1 563	1 622	1 677	1 729
Phos. acid - fertilizer demand	993	1 013	1 103	1 157	1 200	1 241	1 280
Non-phos. acid - fertilizer demand	425	434	387	406	422	436	450
Phosphoric acid -potential balance	2 762	3 079	2 965	2 963	2 919	2 950	2 982
OCEANIA							
Posphoric acid - capacity	600	600	600	600	600	600	600
Phosphoric acid - supply capability	480	480	480	480	480	480	480
Posphoric acid - other uses	17	19	19	19	19	19	19
Phos. acid - available for fertilizer	463	461	461	461	461	461	461
Phosphorus - fertilizer demand	1 208	1 322	1 283	1 307	1 321	1 333	1 337
Phos. acid - fertilizer demand	870	952	936	954	964	973	976
Non-phos. acid - fertilizer demand	338	370	346	353	357	360	361
Phosphoric acid -potential balance	-407	-491	-475	-493	-503	-512	-515

Annex 3
World and regional potassium supply, demand and balance 2016-2022 (thousand tonnes K_2O)

	2016	2017	2018	2019	2020	2021	2022
WORLD							
Potash - capacity	54 638	58 455	61 951	62 055	63 467	63 513	64 553
Potash - supply capability	44 177	46 284	49 422	51 373	52 752	53 664	54 197
Potassium - other uses	5 572	5 752	5 876	5 993	6 112	6 237	6 363
Potassium - available for fertilizer	38 605	40 532	43 546	45 380	46 640	47 427	47 834
Potassium - fertilizer demand	35 434	36 349	37 171	37 971	38 711	39 473	40 232
Potassium - potential balance	3 171	4 183	6 375	7 409	7 929	7 954	7 602
AFRICA							
Potash - capacity	0	0	0	0	0	0	0
Potash - supply capability	0	0	0	0	0	0	0
Potassium - other uses	191	195	198	201	204	208	211
Potassium - available for fertilizer	-191	-195	-198	-201	-204	-208	-211
Potassium - fertilizer demand	707	796	825	860	901	941	985
Potassium - potential balance	-898	-991	-1 023	-1 061	-1 105	-1 149	-1 196
AMERICAS							
Potash - capacity	23 690	25 828	26 433	26 513	26 693	26 693	26 823
Potash - supply capability	16 199	17 015	19 461	20 425	20 705	20 860	20 979
Potassium - other uses	1 882	1 920	1 959	2 001	2 042	2 085	2 130
Potassium - available for fertilizer	14 317	15 095	17 502	18 424	18 663	18 775	18 849
Potassium - fertilizer demand	12 327	12 590	12 800	13 018	13 225	13 452	13 672
Potassium - potential balance	1 990	2 505	4 702	5 406	5 438	5 323	5 177

Table follows in the next page >>

	2016	2017	2018	2019	2020	2021	2022
North America							
Potash - capacity	21 630	23 768	24 373	24 453	24 633	24 633	24 763
Potash - supply capability	14 605	15 421	17 867	18 831	19 111	19 266	19 385
Potassium - other uses	1 225	1 260	1 294	1 330	1 366	1 403	1 441
Potassium - available for fertilizer	13 380	14 161	16 573	17 501	17 745	17 863	17 944
Potassium - fertilizer demand	5 015	5 136	5 184	5 220	5 235	5 255	5 269
Potassium - potential balance	8 365	9 025	11 389	12 281	12 510	12 608	12 675
Latin America & Caribbean							
Potash - capacity	2 060	2 060	2 060	2 060	2 060	2 060	2 060
Potash - supply capability	1 594	1 594	1 594	1 594	1 594	1 594	1 594
Potassium - other uses	657	660	665	671	676	682	689
Potassium - available for fertilizer	937	934	929	923	918	912	905
Potassium - fertilizer demand	7 312	7 454	7 616	7 797	7 990	8 196	8 402
Potassium - potential balance	-6 375	-6 520	-6 687	-6 874	-7 072	-7 284	-7 497
ASIA							
Potash - capacity	10 763	11 137	11 163	11 697	11 914	11 940	11 940
Potash - supply capability	10 599	10 789	10 784	10 903	11 047	11 197	11 197
Potassium - other uses	2 776	2 849	2 913	2 967	3 025	3 085	3 144
Potassium - available for fertilizer	7 823	7 940	7 871	7 936	8 022	8 112	8 053
Potassium - fertilizer demand	17 857	18 411	18 889	19 381	19 813	20 235	20 679
Potassium - potential balance	-10 034	-10 471	-11 018	-11 445	-11 791	-12 123	-12 626
West Asia							
Potash - capacity	3 900	3 935	3 935	3 955	3 985	3 985	3 985
Potash - supply capability	3 825	3 858	3 858	3 877	3 906	3 906	3 906
Potassium - other uses	121	123	126	129	133	136	139
Potassium - available for fertilizer	3 704	3 735	3 732	3 748	3 773	3 770	3 767
Potassium - fertilizer demand	295	298	301	301	304	308	312
Potassium - potential balance	3 409	3 437	3 431	3 447	3 469	3 462	3 455

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	2016	2017	2018	2019	2020	2021	2022
South Asia							
Potash - capacity	65	65	65	65	65	65	65
Potash - supply capability	33	33	33	33	33	33	33
Potassium - other uses	289	315	322	323	327	333	337
Potassium - available for fertilizer	-256	-282	-289	-290	-294	-300	-304
Potassium - fertilizer demand	3 055	3 404	3 494	3 710	3 900	4 099	4 306
Potassium - potential balance	-3 311	-3 686	-3 783	-4 000	-4 194	-4 399	-4 610
East Asia							
Potash - capacity	6 798	7 137	7 163	7 677	7 864	7 890	7 890
Potash - supply capability	6 741	6 898	6 893	6 993	7 108	7 258	7 258
Potassium - other uses	2 366	2 411	2 465	2 515	2 565	2 616	2 668
Potassium - available for fertilizer	4 375	4 487	4 428	4 478	4 543	4 642	4 590
Potassium - fertilizer demand	14 507	14 709	15 094	15 370	15 608	15 828	16 062
Potassium - potential balance	-10 132	-10 222	-10 666	-10 892	-11 065	-11 186	-11 472
EUROPE							
Potash - capacity	20 185	21 490	24 355	23 845	24 860	24 880	25 790
Potash - supply capability	17 379	18 480	19 177	20 045	21 000	21 607	22 021
Potassium - other uses	715	779	797	815	832	850	869
Potassium - available for fertilizer	16 664	17 701	18 380	19 230	20 168	20 757	21 152
Potassium - fertilizer demand	4 149	4 121	4 227	4 278	4 334	4 405	4 453
Potassium - potential balance	12 515	13 580	14 153	14 952	15 834	16 352	16 699
Central Europe							
Potash - capacity	0	0	0	0	0	0	0
Potash - supply capability	0	0	0	0	0	0	0
Potassium - other uses	26	26	26	27	27	28	28
Potassium - available for fertilizer	-26	-26	-26	-27	-27	-28	-28
Potassium - fertilizer demand	834	839	847	859	874	900	914
Potassium - potential balance	-860	-865	-873	-886	-901	-928	-942

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	2016	2017	2018	2019	2020	2021	2022
West Europe							
Potash - capacity	4 805	4 620	4 545	4 035	4 110	4 010	4 050
Potash - supply capability	3 734	3 768	3 606	3 318	3 355	3 313	3 344
Potassium - other uses	535	550	564	578	592	607	623
Potassium - available for fertilizer	3 199	3 218	3 042	2 740	2 763	2 706	2 721
Potassium - fertilizer demand	2 110	2 151	2 160	2 163	2 167	2 173	2 177
Potassium - potential balance	1 089	1 067	882	577	596	533	544
East Europe and Central Asia							
Potash - capacity	15 380	16 870	19 810	19 810	20 750	20 870	21 740
Potash - supply capability	13 645	14 712	15 571	16 727	17 645	18 294	18 677
Potassium - other uses	154	203	207	210	213	215	218
Potassium - available for fertilizer	13 491	14 509	15 364	16 517	17 432	18 079	18 459
Potassium - fertilizer demand	1 205	1 131	1 219	1 256	1 294	1 332	1 362
Potassium - potential balance	12 286	13 378	14 145	15 261	16 138	16 747	17 097
OCEANIA							
Potash - capacity	0	0	0	0	0	0	0
Potash - supply capability	0	0	0	0	0	0	0
Potassium - other uses	8	9	9	9	9	9	9
Potassium - available for fertilizer	-8	-9	-9	-9	-9	-9	-9
Potassium - fertilizer demand	394	431	430	434	438	440	443
Potassium - potential balance	-402	-440	-439	-443	-447	-449	-452

Annex 4
Regional classification of countries and territories

AFRICA	
North Africa	Algeria Egypt Libya Morocco Sudan Sudan (former) Tunisia
Sub-Saharan Africa	Angola Benin Botswana Burkina Faso Burundi Cabo Verde Cameroon Central African Republic Comoros Congo Côte d'Ivoire Democratic Republic of the Congo Djibouti Equatorial Guinea Eritrea Eswatini Ethiopia Gabon Gambia Ghana Guinea Guinea-Bissau Kenya Lesotho Liberia Madagascar Malawi Mali Mauritania

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	Mauritius Mozambique Namibia Niger Nigeria Rwanda Senegal Seychelles Sierra Leone Somalia South Africa South Sudan Togo Uganda United Republic of Tanzania Zambia Zimbabwe
AMERICAS	
Latin America & Caribbean	Antigua and Barbuda Argentina Bahamas Barbados Belize Bolivia (Plurinational State of) Brazil Chile Colombia Costa Rica Cuba Dominica Dominican Republic Ecuador El Salvador Grenada Guatemala Guyana Haiti Honduras Jamaica Mexico Nicaragua

Table follows in the next page >>

	Panama Paraguay Peru Saint Kitts and Nevis Saint Lucia Saint Vincent and the Grenadines Suriname Trinidad and Tobago Uruguay Venezuela (Bolivarian Republic of)
North America	Canada United States of America
ASIA	
East Asia	Brunei Darussalam Cambodia China Indonesia Japan Lao People's Democratic Republic Malaysia Mongolia Myanmar Philippines Republic of Korea Singapore Thailand Timor-Leste Viet Nam
South Asia	Bangladesh Bhutan India Maldives Nepal Pakistan Sri Lanka
West Asia	Afghanistan Bahrain Cyprus Iran (Islamic Republic of)

Table follows in the next page >>

	Iraq Israel Jordan Kuwait Lebanon Oman Qatar Saudi Arabia Syrian Arab Republic Turkey United Arab Emirates Yemen
EUROPE	
Central Europe	Albania Bosnia and Herzegovina Bulgaria Croatia Czechia Hungary Montenegro Poland Romania Serbia Serbia and Montenegro Slovakia Slovenia The former Yugoslav Republic of Macedonia
Eastern Europe and Central Asia	Armenia Azerbaijan Belarus Estonia Georgia Kazakhstan Kyrgyzstan Latvia Lithuania Republic of Moldova Russian Federation Tajikistan Ukraine Uzbekistan

Western Europe	Andorra Austria Belgium Denmark Finland France Germany Greece Iceland Ireland Italy Luxembourg Malta Monaco Netherlands Norway Portugal San Marino Spain Sweden Switzerland United Kingdom of Great Britain and Northern Ireland
OCEANIA	
	Australia Cook Islands Fiji French Polynesia Kiribati Marshall Islands Micronesia (Federated States of) Nauru New Caledonia New Zealand Niue Palau Papua New Guinea Samoa Tonga Tuvalu Vanuatu

Note: Bermuda is included in the United Kingdom of Great Britain and Northern Ireland

World **fertilizer** trends and outlook to **2022**

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This report presents the world nitrogen, phosphorus and potassium fertilizer medium-term supply and demand forecasts for the period 2017-2022. FAO, in collaboration with other members of the Fertilizer Outlook Expert Group dealing with fertilizer production, consumption and trade, provides forecasts of world and regional fertilizer supply, demand and potential balance.

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