

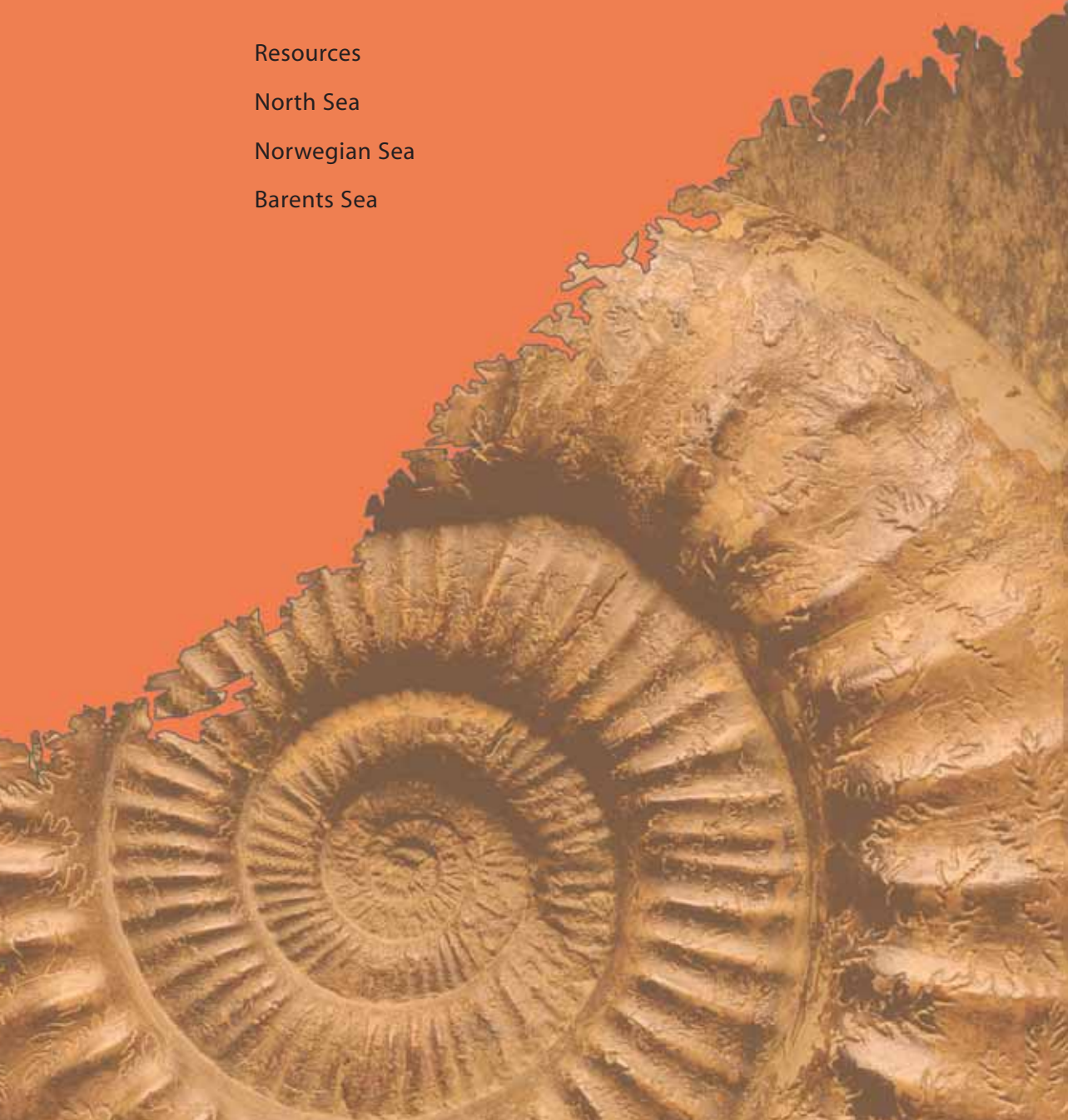
5 Petroleum resources

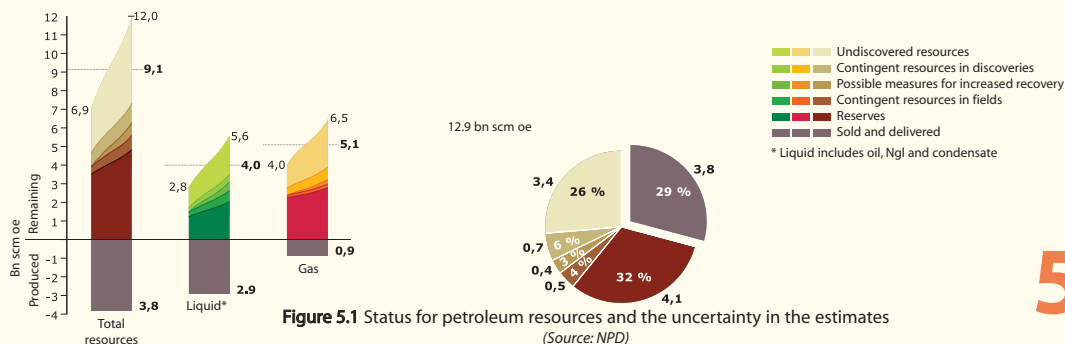
Resources

North Sea

Norwegian Sea

Barents Sea





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Discovered and undiscovered resources on the NCS are expected to total just over 12.9 bn scm oe. Production to date amounts to 3.8 bn scm oe, corresponding to 29 per cent of total resources. Remaining recoverable resources thereby total 9.1 bn scm oe, of which proven reserves represent 5.3 bn scm oe. Undiscovered petroleum resources on the NCS are estimated at 3.4 bn scm oe. In addition, possible future measures for improving resource utilisation from fields are expected to add a total of 0.4 bn scm oe. An uncertainty range of 6.9-12.0 bn scm oe is applied for the expected figure of 9.1 bn scm oe.

Total resources discovered by exploration in 2003 were larger than in recent years. Eleven new discoveries were made, containing in the order of 30-90 million scm of recoverable oil and 35-70 bn scm of recoverable gas.

Since petroleum production began on the NCS in 1971, a total of 3.8 bn scm oe has been produced from 60 fields. The Fram, Grane and Mikkel fields came on stream in 2003. Forty-two of the fields in production at 31 December 2003 lie in the North Sea and six in the Norwegian Sea. The Kristin, Kvitebjørn, Skirne and Snøhvit fields are covered by approved plans for development and operation (PDO), but have not started to produce yet.

Table 5.1 presents total petroleum resources on the NCS, classified in accordance with the NPD's resource classification system and divided between three geographic regions. The future potential for improved resource utilisation is included in total resources but not broken down by region.

Resources

Resources are a collective term for technically recoverable quantities of petroleum. They are classified by the maturity of the industrial project required to recover them. The principal classes are reserves, contingent resources and undiscovered resources.

Reserves

Reserves are the volume of petroleum found in a field which is producing or covered by sanctioned projects or projects which are decided to develop. Norwegian reserves are estimated at 4.1 bn scm oe, and increased by 0.3 bn scm oe in 2003. This primarily reflects the reclassification of resources in Ormen Lange from contingent resources to reserves.

Contingent resources

Contingent resources are resources in specified but unsanctioned projects. Contingent resources in separate discoveries are estimated at 1.3 bn scm oe, representing a decline of 0.4 bn scm oe from 2003 to 2004. This primarily reflects the fact that Ormen Lange is now booked as reserves. Contingent resources in fields relating to planned projects for improved recovery increased by a marginal three mill scm oe in 2003. This reflects the fact that the 29.3 mill scm oe in projects which secured approval for their PDO was more than replaced by resources in new projects for improved recovery from other fields.

Estimates for possible future improved recovery measures and for undiscovered resources were revised in the spring of 2003 to 0.4 bn scm oe. Pos-

sible measures for improved recovery are calculated on the basis for the government's goal of achieving an average recovery factor of 50 per cent for oil from oil fields and 75 per cent for gas from gas fields.

The reduction for oil partly reflects the fact that a number of projects became specific and were thereby closer to realisation, and partly changes in the method of calculation.

A reduction in the gas estimate by 0.4 bn scm is solely due to the revised calculation method. The main change is that the calculation base is now confined to sanctioned pure oil and pure gas fields respectively. Discoveries and associated gas/oil were also previously included.

Undiscovered resources

The potential for undiscovered resources on the NCS is now estimated at 3.4 bn scm oe, a reduction of 530 mill scm oe from the previous estimate. An uncertainty range of 2.6-3.4 mill scm oe has been established around the 3.4 bn figure.

Changes in the North and Barents Seas are insignificant. The estimate for undiscovered resources in the Norwegian Sea has been reduced by 30 per cent on the basis of increased geological knowledge of the best-explored areas and reduced expectations about the deepwater area. At the same time, the areas off the Lofoten islands are regarded as more promising than before. The uncertainty in the resource estimate is greater in the Norwegian Sea, and particularly in the Barents Sea, than in North Sea. This reflects the fact that these areas are less explored.

North Sea

A total of seven bn scm oe has been found in the North Sea. Of this, 3.4 bn scm oe has been produced and remaining reserves amount to 2.8 bn scm oe. Oil accounts for about 37 per cent of this. North Sea production in 2003 totalled 206 mill scm oe, but increased reserves in producing fields mean that remaining resources in these waters have not been reduced by more than 69 mill scm oe from 2002. No major changes have been made to estimates for contingent and undiscovered resources in the North Sea. Estimated undiscovered resources are put at about 1.2 bn scm oe.

Norwegian Sea

Discoveries in the Norwegian Sea total 1.9 bn scm oe, of which 0.3 bn scm oe has so far been produced. Remaining reserves total some 1.1 bn scm oe, with gas accounting for 62 per cent. Remaining reserves increased by 0.4 bn scm oe, primarily because 375 mill scm oe of gas resources in Ormen Lange are now classified as reserves. Contingent resources in discoveries have been reduced by the same order of magnitude for the same reason. The estimated volume of undiscovered resources in the Norwegian Sea is now just over 1.2 bn scm oe. This is rather lower than before, as noted above.

Barents Sea

Discoveries in the Barents Sea total 0.2 bn scm oe. Production is due to start from these waters in 2005, when Snøhvit comes on stream. Contingent resources in Barents Sea discoveries were reduced in 2003 as a consequence of lower expectations about the resource base. Estimated undiscovered resources are just under one bn scm oe.

Table 5.1 Total recoverable potential and remaining proven reserves and resources at 31 December 2003. (Source: NPD)

Total recoverable potential	Resource accounts at 31.12.03					Changes from 2002				
	Oil	Gas	NGL	Cond	Total	Oil	Gas	NGL	Cond	Total
Project status category	mill scm	bn scm	mill tonnes	mill scm	mill scm oe	mill scm	bn scm	mill tonnes	mill scm	mill scm oe
Produced	2 708	870	68	71	3 779	166	73	6	12	262
Remaining reserves**	1 235	2 456	124	142	4 074	-71	344	6	12	297
Contingent resources in fields	268	167	29	10	501	16	-31	7	-2	-3
Contingent resources in discoveries	230	460	22	33	764	60	-392	6	-31	-351
Possible future measures for improved recovery*	300	100			400	-100	-400	0	0	-500
Undiscovered	1 160	1 900			3 400	-260	-610	0	340	-530
Total NCS	5 900	5 958	244	340	12 918	-191	-1 016	25	332	-825

North Sea										
Produced	2 414	838	64	62	3 436	132	60	4	7	206
Remaining reserves**	1 041	1 644	65	24	2 833	-31	-33	0	-5	-69
Contingent resources in fields	215	126	23	6	391	-12	-18	7	1	-16
Contingent resources in discoveries	120	154	5	20	303	18	-15	2	-3	3
Undiscovered	615	500		75	1 190	-15	-70	0	75	-10
Total	4 406	3 262	157	187	8 153	92	-77	12	75	109

Norwegian Sea										
Produced	293	32	4	9	343	34	14	2	5	56
Remaining reserves**	194	655	54	100	1 052	-41	378	6	17	366
Contingent resources in fields	42	37	7	4	96	25	-13	0	-3	11
Contingent resources in discoveries	98	299	17	13	442	42	-368	5	-27	-344
Undiscovered	235	810		175	1 220	-245	-460	0	175	-530
Total	863	1 834	82	301	3 153	-184	-448	13	167	-442

Barents Sea										
Produced	0	0	0	0	0	0	0	0	0	0
Remaining reserves**	0	161	5	18	189	0	0	0	0	0
Contingent resources in fields	10	4	0	1	15	2	0	0	0	2
Contingent resources in discoveries	11	7	0	0	18	-1	-9	0	-1	-10
Undiscovered	310	590		90	990	0	-80		90	10
Total	331	762	5	109	1 212	2	-89	0	89	2

* Resources from future IOR measures are registered at the aggregate level, and no division has been made between the various regions.

** Includes resource categories 1, 2 and 3 (see the explanation on page 69).