



NORWEGIAN PETROLEUM  
DIRECTORATE



# **Potential Application of the UNFC-2009 in Government Resource Management**

Example from Norway

Kjell Reidar Knudsen, Norwegian Petroleum Directorate (NPD)

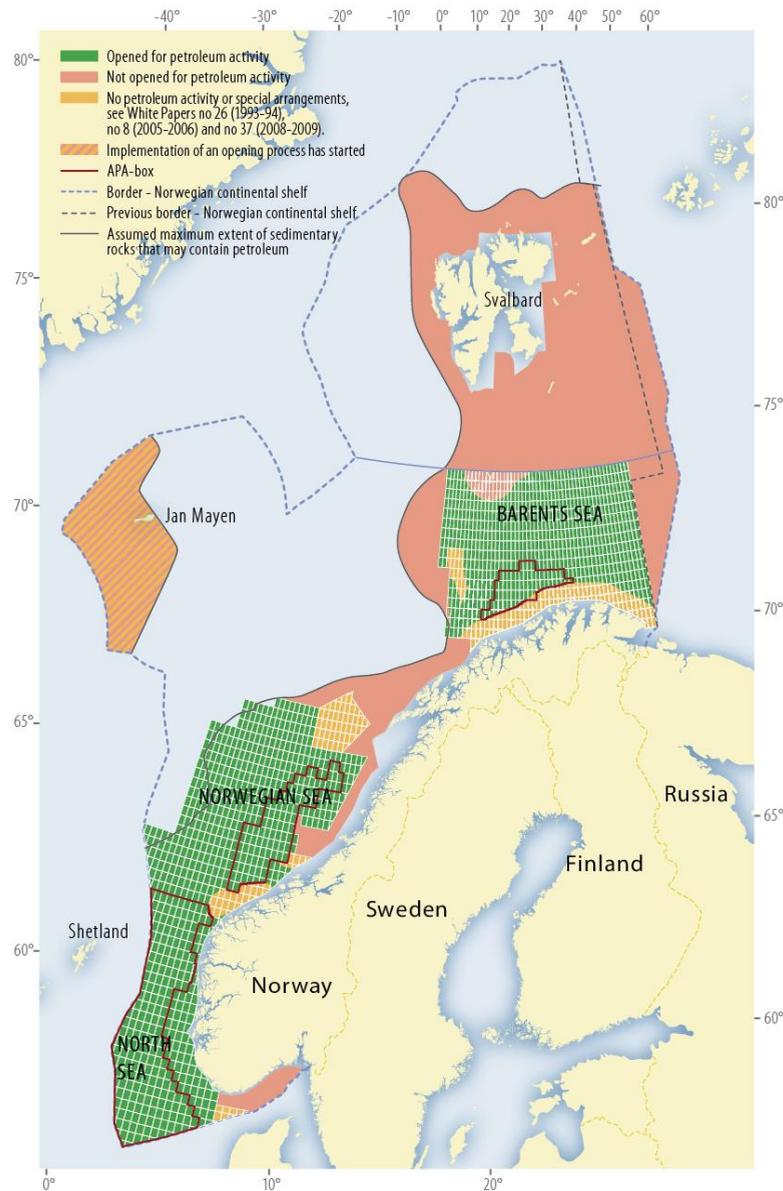
Stavanger, Norway

# Agenda

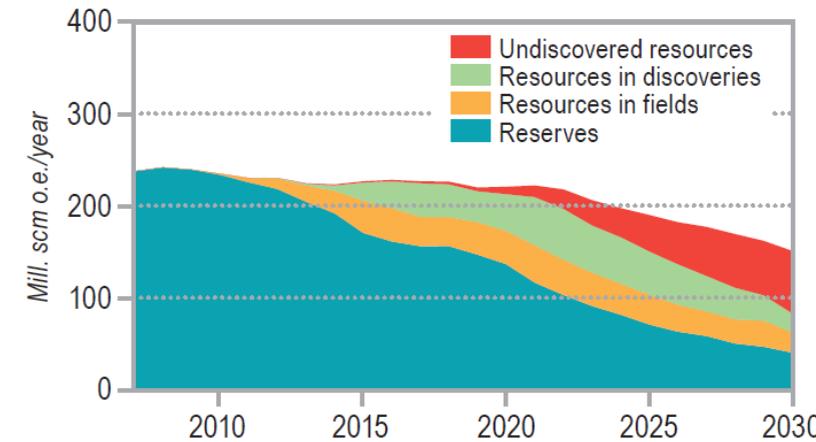
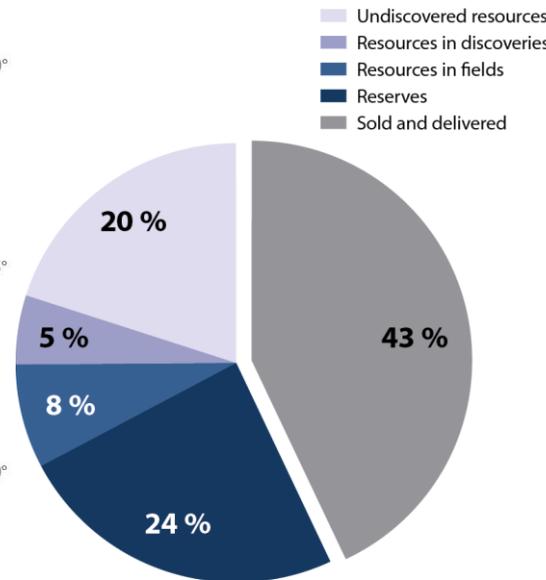
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- ◆ Norwegian Petroleum Directorate
- ◆ Why we classify the Petroleum Resources
- ◆ Status on the "UNFC Mapping Project"
  - ◆ Challenges and experiences so far
- ◆ Future plans

# The Norwegian Continental Shelf

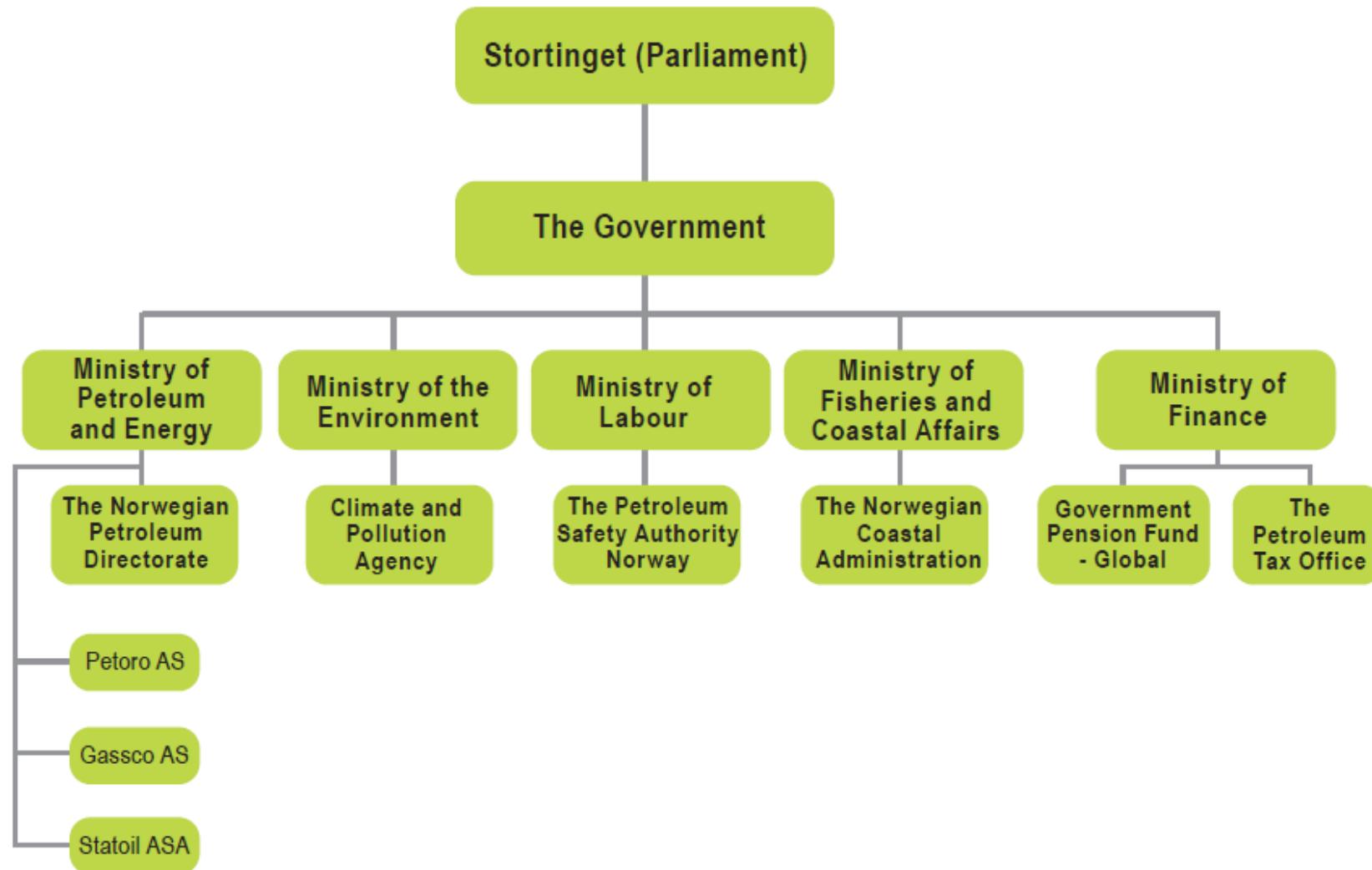


Total resources : 81 billion barrels o.e.



- ◆ 70 producing fields
- ◆ 7 fields under development
- ◆ 1400 exploration wellbores
- ◆ 3500 development wellbores

# State organization of the petroleum sector in Norway



# Some important NPD tasks

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- ◆ The NPD has a national responsibility for data from the Norwegian continental shelf.
- ◆ The NPD's data, overview and analyses constitute a crucial factual basis on which the activities are founded.
- ◆ The NPD shall be a driving force for realizing the resource potential by emphasizing long-term solutions, upside opportunities, economies of scale and joint operations, as well as ensuring that time-critical resources are not lost.

# Why does the NPD classify the petroleum resources and profiles?

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- ◆ Keeping track of resources and subsequent profiles for central government and statistical purposes
  - ◆ Annual update to the public
  - ◆ Semi annual updates to the Ministry of Energy and Ministry of Finance
- ◆ Monitoring the oil companies in their effort in optimisation of exploration and production
  - ◆ Annual reporting to NPD of resources and profiles

# Petroleum Act

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## Section 4-1 Prudent production

- ◆ Production of petroleum shall take place in such a manner that as much as possible of the petroleum in place in each individual petroleum deposit, or in several deposits in combination, will be produced. The production shall take place in accordance with prudent technical and sound economic principles and in such a manner that **waste of petroleum or reservoir energy is avoided**. **The licensee shall carry out continuous evaluation of production strategy and technical solutions and shall take the necessary measures in order to achieve this.**

# Core elements of the NPD classification system



- ◆ Handles the total resources (discovered and undiscovered) as well as individual projects
- ◆ Reflects legal framework and decision points
- ◆ Builds upon project maturity
  - ◆ Ability to combine the volume estimates of each project with other relevant information/data
- ◆ Track project maturation

		Classes	Project categories	
		Recoverable quantities	Discovered	Historic prod.
Reserves	1 2 3			In production Approved for development Decided for development
Contingent resources	4 5 6 7			In planning phase Recovery likely, but undecided Recovery not very likely Not evaluated/Improved recov pot.
Un-Discovered	Undiscovered resources		8 9	Prospects Leads and plays

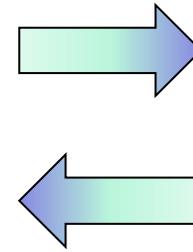
# Company reporting to the NPD

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- ◆ Annual reporting to the NPD based upon NPD classification system (mandatory)
- ◆ What is reported:
  - ◆ Volumes (in-place and recoverable)
  - ◆ Profiles (production, investments, operating costs, emissions,...)
- ◆ NPD also develops its own data sets
- ◆ Consistent dataset
  - ◆ Ex: can not have production without first having investments, costs and emissions

# Mapping NPD and UNFC project

		Classes		Project categories
Recoverable quantities	Discovered	Historic prod.	0	Sold and delivered
		Reserves	1 2 F/A 3 F/A	In production Under development Decided for development
		Contingent resources	4 F/A 5 F/A 6 7 F/A	In planning phase Recovery likely, but undecided Recovery not very likely Not evaluated/Improved recov pot.
	Un-discovered	Undiscovered resources	8 9	Prospects Leads and plays



UNFC-2009		
Known Deposit	Commercial Projects	On Production
		Approved for Development
		Justified for Development
	Potentially Commercial Projects	Development Pending
		Development On Hold
Non-Commercial Projects	Development Unclearified	
	Development Not Viable	
Additional quantities in place		
Potential Deposit	Exploration Projects	
	Additional quantities in place	

F = First, A = Additional

# UNFC Specification Document

## Introduction

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The principal objective of UNFC-2009 is **to enhance international communication** by providing a simple, generic classification framework for the reporting of fossil energy and mineral reserves and resources, even though such **estimates may have been generated using classification or reporting systems** that: (i) may use **different terminology** for comparable estimates, or the same terminology with different meanings; (ii) **incorporate application guidelines** that are commodity-specific; and, (iii) may reflect the extraction of solids by mining or the production of fluids through wells. UNFC-2009 has been developed to meet, to the extent possible, the needs of applications pertaining to international energy and mineral studies, **government resource management functions**, corporate business processes and financial reporting standards.

# UNFC 2009 and SPE-PRMS

	UNFC-2009		SPE-PRMS (petroleum)	
Known Deposit	Commercial Projects	On Production	Reserves	On Production
		Approved for Development		Approved for Development
		Justified for Development		Justified for Development
	Potentially Commercial Projects	Development Pending	Contingent Resources	Development Pending
		Development On Hold		Development Unclassified or On Hold
	Non-Commercial Projects	Development Unclassified		Development Not Viable
		Development Not Viable		
Additional quantities in place		Unrecoverable		
Potential Deposit	Exploration Projects		Prospective Resources	Prospect
				Lead
				Play
	Additional quantities in place		Unrecoverable	

# UNFC 2009 and SPE-PRMS

UNFC-2009		
Known Deposit	Commercial Projects	On Production
		Approved for Development
		Justified for Development
	Potentially Commercial Projects	Development Pending
		Development On Hold
	Non-Commercial Projects	Development Unclassified
Development Not Viable		
Additional quantities in place		
Potential Deposit	Exploration Projects	
	Additional quantities in place	

SPE-PRMS (petroleum)	
Reserves	On Production
	Approved for Development
	Justified for Development
Contingent Resources	Development Pending
	Development Unclassified or On Hold
	Development Not Viable
Unrecoverable	
Prospective Resources	Prospect
	Lead
	Play
Unrecoverable	

# NPD-2001 , UNFC 2009 and SPE-PRMS

	UNFC-2009		NPD		SPE-PRMS (petroleum)	
Known Deposit	Commercial Projects	On Production	Reserves	In production	Reserves	On Production
		Approved for Development		Approved for development		Approved for Development
		Justified for Development		Decided for development		Justified for Development
	Potentially Commercial Projects	Development Pending	Contingent Resources	In planning phase	Contingent Resources	Development Pending
		Development On Hold		Recovery likely, but undecided		Development Unclearified or On Hold
	Non-Commercial Projects	Development Unclearified		Not evaluated / Improved rec. pot.		Development Not Viable
		Development Not Viable		Recovery not very likely		
Additional quantities in place		Not applicable		Unrecoverable		
Potential Deposit	Exploration Projects	Undiscovered Resources	Prospect	Prospective Resources	Prospect	
			Lead and play		Lead	
					Play	
Additional quantities in place		Not applicable		Unrecoverable		

# Norwegian Resource figures



UNFC-2009					NPD as of 2003	NPD as of 2004	NPD as of 2005	NPD as of 2006	NPD as of 2007	NPD as of 2008	NPD as of 2009	NPD as of 2010	NPD 2001	
Sales Production	Non-sales production				MSM3	MSM3	MSM3	MSM3	MSM3	MSM3 o.e.	MSM3 o.e.	MSM3 o.e.		
					3779	4044	4324	4573	4811	5055	5287	5520,7		
Class	Sub-class	E	F	G									Category	Class
Commercial Projects		1	1	1,2,3	4074	3930	3898	3659	3611	3407	3169	3123	1,2,3	Reserves
Potentially commercial projects		2	2	1,2,3	1196	1275	1174	1221	1080	1151	1162	1224	4,5	Contingent resources
Non-commercial Projects		3	2	1,2,3	469	235	293	287	293	418	454	397	6,7	
Additional quantities in place		3,3	4	1,2,3	N/A									
Exploration Projects	No sub-classes defined	3	3	4	3400	3400	3400	3400	3400	3400	3280	2570	8,9	Undiscovered resources
Additional quantities in place		3,3	4	4	N/A									

# Norwegian Resource figures



UNFC - 2009					31.12.2003	31.12.2004	31.12.2005	31.12.2006	31.12.2007	NPD per 31.12.2008	NPD as of 31.12.2009	NPD as of 31.12.2010	NPD 2001		
					Msm <sup>3</sup> o.e.										
Class	Sub-class	E	F	G									Category	Class	
Sales Production					3 779	4 044	4 324	4 573	4 811	5055	5287	5521			Sales Production
Non-sales production															
<b>Commercial Projects</b>	On production	1	1,1	1, 2, 3	2837	2781	2796	2497	2812	2634	2604	2506	In production	1	Reserves
	Approved for Development	1	1,2	1, 2, 3	422	788	757	781	549	490	236	221	Approved PDO	2 F/A	
	Justified for Development	1	1,3	1, 2, 3	814	361	344	381	250	283	329	396	Licences decided to recover	3 F/A	
<b>Potentially Commercial Projects</b>	Development pending	2	2,1	1, 2, 3	620	654	498	534	440	561	538	654	In the planning phase	4 F/A	Contingent Resources
	Development on hold	2	2,2	1, 2, 3	576	621	676	687	640	590	624	570	Recovery likely but undecided	5 F/A	
<b>Non-Commercial Projects</b>	Development unclarified	3,2	2,2	1, 2, 3	469	235	293	287	293	418	454	397	Not yet evaluated	7 F/A	Contingent Resources
	Development not Viable	3,3	2,3	1, 2, 3	N/A	Recovery not very likely	6								
	Additional quantities in place	3,3	4	1, 2, 3	N/A										
<b>Exploration Projects</b>	No sub-classes defined	3,2	3	4	3400	3400	3400	3400	3400	3400	3280	2570	Prospect	8	Undiscovered resources
													Lead and Play	9	
	Additional quantities in place	3,3	4	4	N/A										

# Coarse mapping of one to one classes

NPD classes	NPD Categories	UNFC classes	
Reserves	0+1	E1.1F1.1	
	2 A & 2F	E1.1F1.2	
	3 A & 2F	E1.1F1.3	
Contingent Resources	4 A & 4 F	E1.1F2.2	
		E2F2.1	
		E2F2.2	
	5 A & 5 F	E1.1F2.1	
	6	E3.3F2.3	
Undiscovered resources	7 A & 7 F	E1.1F2.1	
		E1.1F2.3	
		E1.1F3	
		E1.2F2.1	
		E1.2F2.3	
		E2F2.1	
		E2F2.3	
		E3.2F2.2	
		8	E3F3G4
		9	E3.2F3

# NPD Mapping Document

UNFC-NPD Mapping Document [Skrevetbeskyttet] - Microsoft Excel

Hjem Sett inn Sideoppsett Formler Data Se gjennom Visning

Calibri 8 A A+ Bryt tekst Standard % 000 +0,00 -0,00

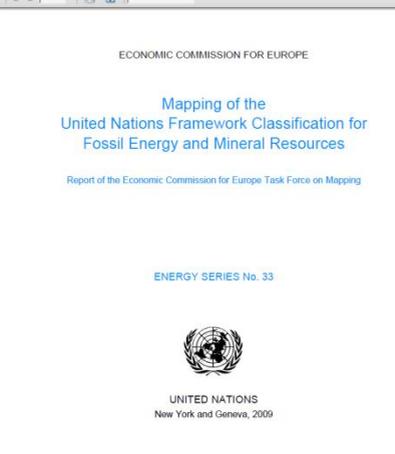
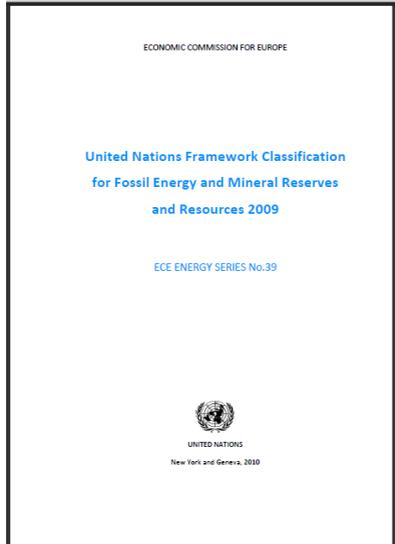
Utklippst... Skrift Justering Tall Betinget formatering Formater som tabell Cellstiler Sett inn Slett Format Autosummer Fyll Fjern Sorter og Søk etter og merk Redigering

Serverarbeidsbok Du må sjekke ut denne arbeidsboken før du kan endre den. Sjekk ut

D3	DK1	A	B	C	D	E	F	G	H	I	J	K	L	M	N
		Cat	UNFC Definitions	UNFC Supporting Explanation	NPD Category	NPD Definition		NPD supporting documentation (Reporting Guidelines)	NPD supporting documentation (Reporting Guidelines)	NPD supporting documentation (Reporting Guidelines)	NPD supporting documentation (Reporting Guidelines)	Comment for improvements of NPD system			
1		E1	Extraction and sale has been considered to be essentially viable. The above "essentially viable" encompasses reserves in the narrow sense plus other relevant "market conditions", and includes consideration of price, costs, technical feasibility, environmental, social and all other non-technical factors that would directly impact the viability of a development project.	Extraction and sale is considered on the basis of current market conditions and realistic assumptions of future market conditions. All reserves projects/activities have been assessed on their own. Reserves quantities that all such approved projects will be obtained within a reasonable timeframe. Economic viability is not affected by short-term adverse market conditions provided that long-term forecasts remain positive.		For mapping of sub-categories		The reserves narrative shall be completed for all fields and disclosures, unless otherwise agreed with the NPD. Fields and disclosures will be completed in higher reserves subcategory with associated reserves. Projects with associated reserves in subcategory E1 shall be reported directly in the applicable profile subtable. Expected reserves subcategory as of 31 December of the current year shall be used as a basis for the reporting. Only the Reserve percentage of the reserves is related according to the distribution provided under "General Information". <b>Figures shall be reported for the entire lifetime of a field or disclosure, including reserves that can be re-assessed after the expiry of the license period. Fields that consist of</b>		Reserves-Regulations (2004/2005). Reserves: Complete the remaining, reasonable, <b>marketable petroleum reserves</b> from petroleum deposit, <b>minus the Reserves base decided in license and for which the authorities have approved a PDD or have received acceptance from the requirements relating to a PDD. Reserves also comprise petroleum reserves which the licensees have decided to develop but for which the authorities have not yet approved a PDD or granted acceptance from.</b>	Guidelines to PDD 4.2.2 (Reserves) role and production schedule (production profile) The description of the national production and reserves role should include the following: - Technically recoverable reserves linked to various production methods - <b>reasonable reserves</b> - <b>Reserves of the recoverable reserves under the conditions on which the plan is based</b> - Expected production profiles for oil, gas and condensate (MGL for the entire field and for approved areas, or different production facilities, if applicable, should be related, in addition to the national profile). The licensees must show all reserves high and low low initially, together with a probability distribution. The licensees should also show how the				
2					RK1		Reservable reserves shall be selected for all disclosures and fields. The reserves should be divided between the <b>sub-categories</b> oil, MGL, condensate and gas. High, low (reported) and low (not reported) shall be reported for reservable reserves, with the exception of MGL, see Chapter 4.2 Profiles for petroleum production, sale, transport and injection. Gas comprises quantities which are sold and physically delivered as planned in the defined. Gas bought from other fields for injection purposes and which later will be reported, shall not be included in the reserves base. Gas received without approval shall be included in the reserves base. This gas is reported as gas and for reserves ordered. Gas used for <b>flaring and fuel shall not be included</b> in the reserves base.		<b>S.2 Completing the "Reserves Narrative"</b> The reserves narrative shall be completed for all fields and disclosures, unless otherwise agreed with the NPD. Fields and disclosures will be completed in higher reserves subcategory with associated reserves. Projects with associated reserves in subcategory E1 shall be reported directly in the applicable profile subtable. Expected reserves subcategory as of 31 December of the current year shall be used as a basis for the reporting. Only the Reserve percentage of the reserves is related according to the distribution provided under "General Information". <b>Figures shall be reported for the entire lifetime of a field or disclosure, including reserves that can be re-assessed after the expiry of the license period. Fields that consist of several disclosures shall report reserves for each individual disclosure.</b>	Reserves RC 1-3 represent petroleum quantities associated with projects in fields in production, projects which have an approved plan for development and operations, or projects <b>where the licensees have decided to reserve the petroleum</b> . Projects involving gas, where a production schedule has not been decided, but where the gas may be produced and sold later without major investments, should be reported in RC 3. This percentage shall decrease over time as reserves in available.					
3							Reservable quantities of petroleum		Reserves-Regulations Section 16 Evaluation of a petroleum deposit When a petroleum deposit has been proven by drilling, the licensees shall submit to the Norwegian Petroleum Directorate information on the plan for further exploration as well as results from registration of the deposit. The realisation of the petroleum deposit shall be submitted in writing to the Norwegian Petroleum Directorate within six months of the deposit being proven. If probabilities of the petroleum deposit being viable petroleum has been established through tests, sampling or logging, the <b>licensees shall in addition include the size of the petroleum deposit and submit plans for the maximum conditions</b> . The Norwegian Petroleum Directorate may require further realisation and information to be submitted						

Descriptions Ark2 Ark3

Klar 90%



# Future plan

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- ◆ The main goal is to classify each individual project in Norway, by applying the
  - ◆ UNFC-specification ,
  - ◆ UNFC-supporting explanation
  - ◆ UNFC generic specification
  - ◆ and the mapping document (which sufficiently comply with UNFC but not necessarily fully compliant with SPE-PRMS)

# Pilot testing assumptions, detailed mapping



The number of projects contributing to the annual resource account could be more than 600, depending on how they are defined and counted

NPD classes	NPD Categories	UNFC classes
Reserves	0+1	E1.1F1.1
	2 A & 2F	E1.1F1.2
	3 A & 2F	E1.1F1.3
Contingent Resources	4 A & 4 F	E1.1F2.2
		E2F2.1
		E2F2.2
	5 A & 5 F	E1.1F2.1
	6	E3.3F2.3
	7 A & 7 F	E1.1F2.1
		E1.1F2.3
		E1.1F3
		E1.2F2.1
		E1.2F2.3
E2F2.1		
E2F2.3		
E3.2F2.2		
Undiscovered resources	8	E3F3G4
	9	E3.2F3



4A & 4F: 104 projects

5A & 5F: 136 projects

7F: 36 projects; 7A: 154 projects;  
Total 190 projects

# Cooperation with Statoil

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- ◆ Allocate correct UNFC-class to each project
  - ◆ Must separate into E and F axis
- ◆ A group of selected discoveries and fields



NORWEGIAN PETROLEUM  
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Thank you....