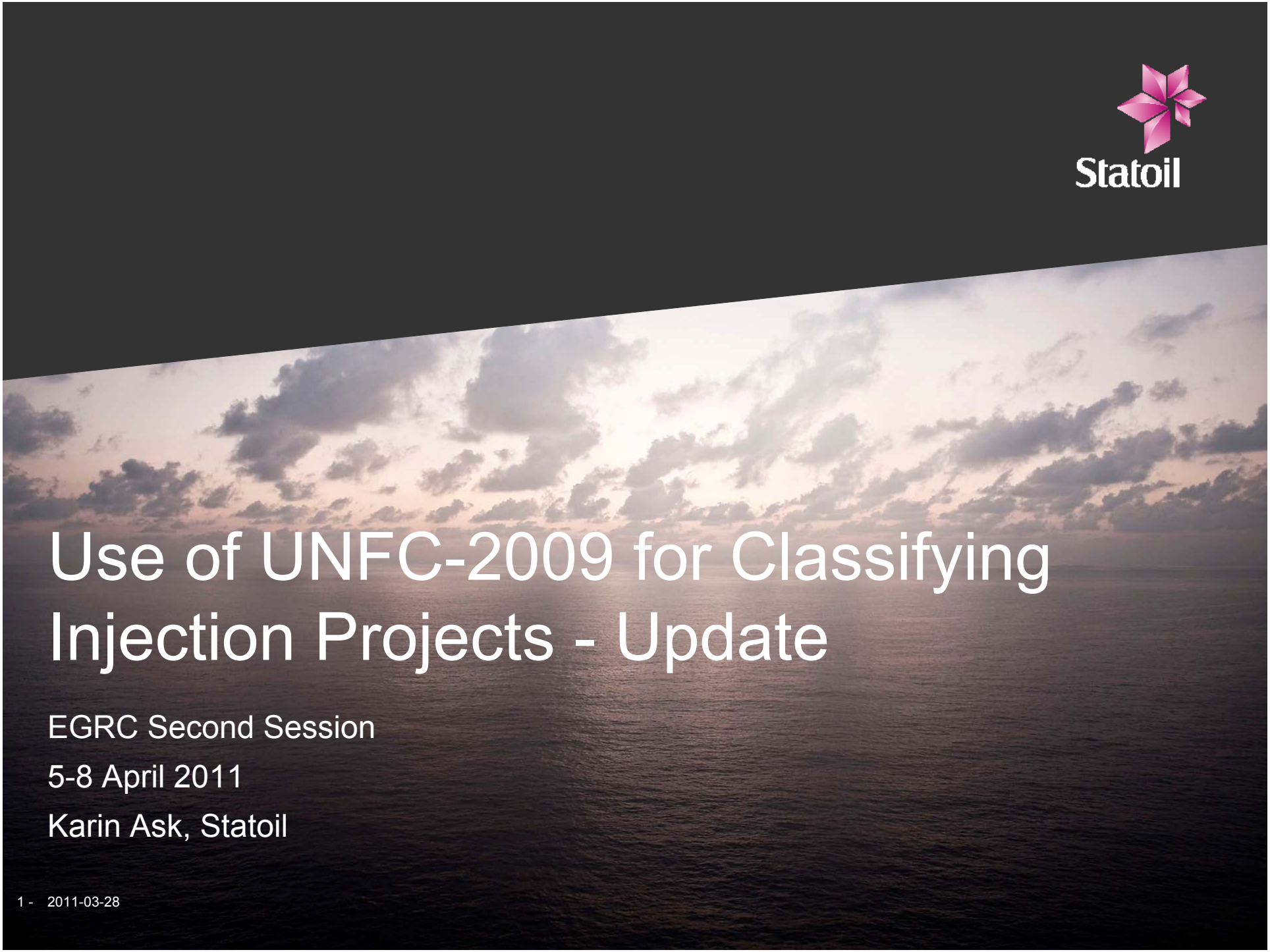


Use of UNFC-2009 for Classifying Injection Projects - Update

EGRC Second Session

5-8 April 2011

Karin Ask, Statoil

UNFC 2009

- ✓ **Introduction**
- ✓ **Task Force members**
- ✓ **Progress since last EGRC session**
- ✓ **The way forward**

Statoil

Introduction
- Reminder from EGRC session 1 in 2010

Programme of work for 2009 -10 included an agreement to explore if and how the UNFC could be used in classifying recipient reservoirs or injection projects such as:

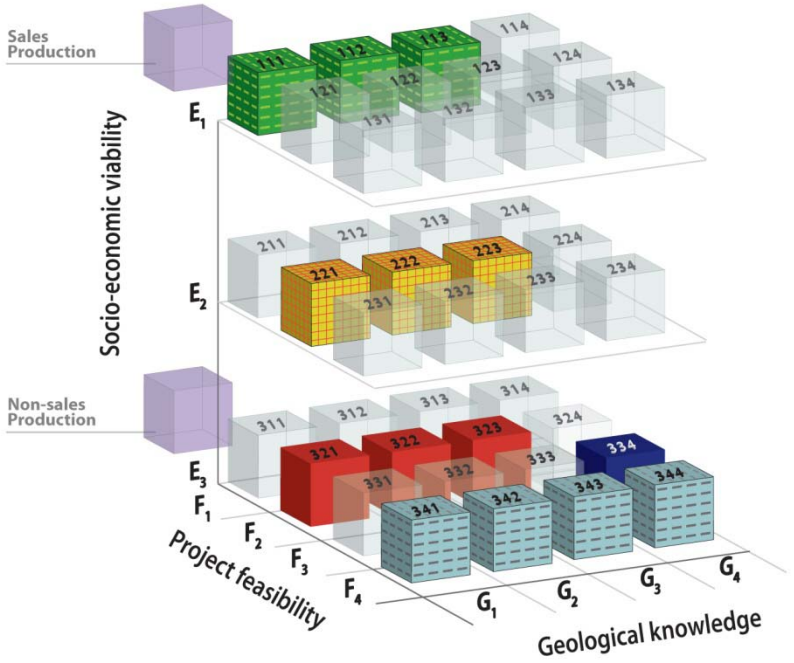
- **Hydro carbon gas injection**
  - Pressure support and increased oil recovery
  - Temporary gas storage
- **CO_2 injection**
  - Permanent storage, also referred to as sequestration
  - Long term storage
  - Increased recovery from a hydro carbon reservoir (EOR)
    - Large part of the CO2 is produced with the oil and re-circulated
- **Disposal/storage of other waste products/gases**

Injection project activities - the simple picture

We need to:

- Understand the geology and dynamic behaviour of the recipient reservoir
- Design a technical concept and evaluate the project feasibility
- Calculate the costs and evaluate the economic and social viability of the project
- Make decisions

These are all activities that we know from oil and gas extraction projects and that are well defined in the UNFC2009



Different challenges for different projects

- Permanent storage without re-production (such as CO_2 sequestration)
  - Simple solution could be to just turn the UNFC around as shown
- Injection and reproduction (temporary storage)
  - Reservoir needs to be classified as both a recipient and as a producer
  - Classified as two separate projects or one?
- Gas injection and reproduction from oil and gas reservoir containing indigenous gas
  - Difficult or impossible to differentiate between produced and reproduced gas and thus for instance what can be counted as reserves and not, in particular if ownership is different

- Different stake holders will have different needs

UNFC2009 - injection projects?

	Injected				
			Class	Categories	
				E	F	G
	Future storage by commercial projects/operations		Commercial Projects	1	1	1,2,3
	Potential future storage by contingent projects/operations		Potentially Commercial Projects	2	2	1,2,3
			Non-Commercial Projects	3	2	1,2,3
	Potential future storage by successful screening activities		Screening Projects	3	3	4

UNFC 2009

- ✓ **Introduction**
- ✓ **Task Force members**
- ✓ **Progress since last EGRC session**
- ✓ **The way forward**

Statoil

Recipient Reservoirs Task Force Members

Ms. Karin Ask – Statoil ASA, Norway

Mr. Marting Hubbig – RWE Dea AG, Germany

Ms. Eva Halland – Norwegian Petroleum Directorate, Norway

UNFC 2009

- ✓ **Introduction**
- ✓ **Task Force members**
- ✓ **Progress since last EGRC session**
- ✓ **The way forward**

Statoil

Progress since last EGRC session

- Main focus has been on looking in to some examples of other classifications that have been proposed by various groups and stake holders.
- Examples are:

a) The Techno-Economic Resource-Reserve pyramid proposed by the Carbon Sequestration Leadership Forum (CSLF) (CSLF, 2007)

b) The CO2CRC classification system for CCS (CO2CRC, 2008)

c) "A New Classification System for Evaluating CO2 Storage Resource/Capacity Estimates" publishad at an SPE International Conference on CO2 (SPE, 2009)

d) A proposal from the United States Department of Energy (US DOE) for a Geologic Storage Framework (US DOE NETL)

UNFC 2009

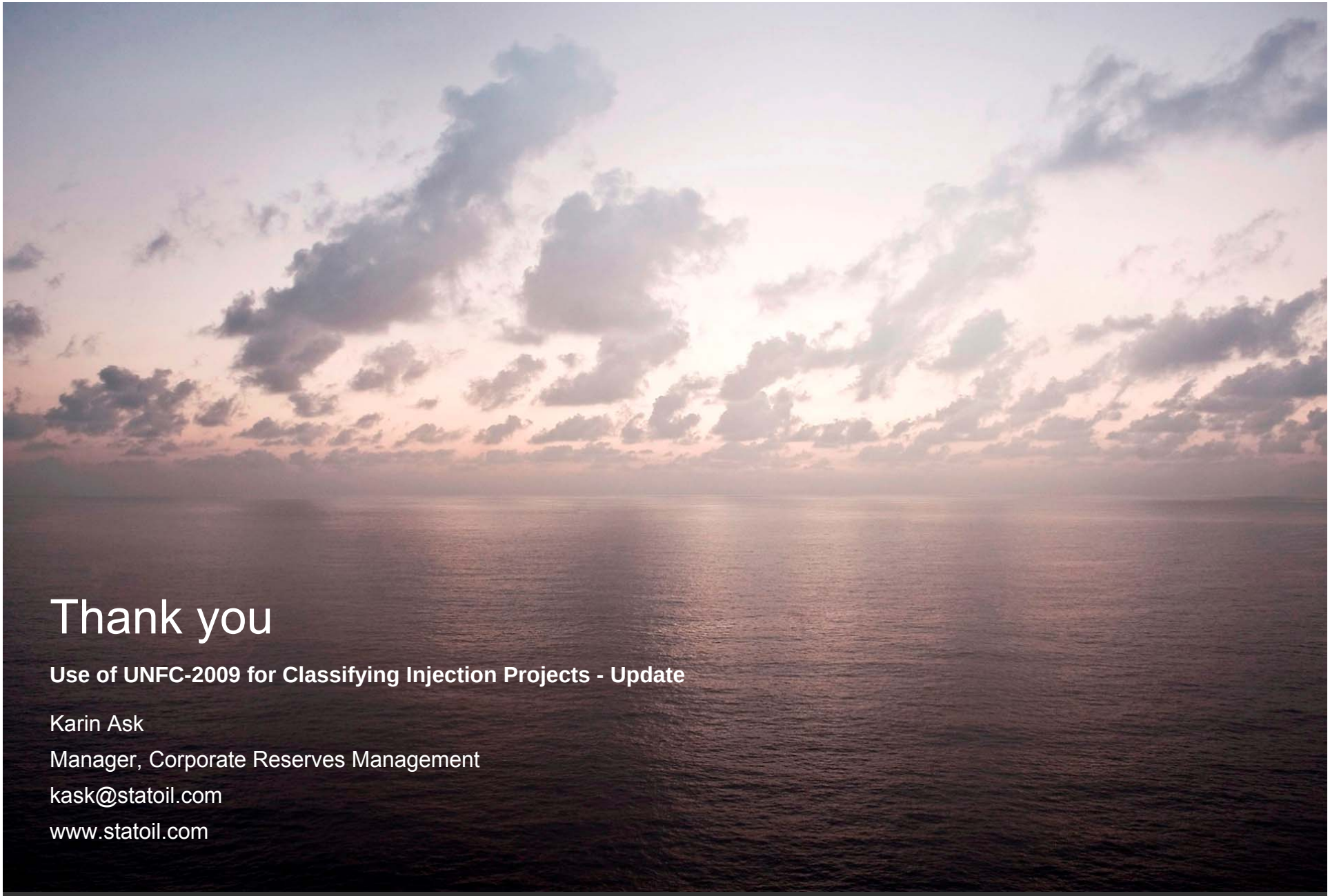
- ✓ **Introduction**
- ✓ **Task Force members**
- ✓ **Progress since last EGRC session**
- ✓ **The way forward**

Statoil

The Way Forward

The Task Force proposes to move forward through:

- Identifying the main stakeholder groups and clarifying what their needs and expectations are
- Investigate how for instance oil and gas companies classify and evaluate the maturity of their gas injection projects today
- Review the Underground Gas Storage Study prepared by the United Nations Economic Commission for Europe (UNECE) Working Party on Gas and consider relevant elements in this study
- Propose how to adapt the UNFC-2009 for use on injection projects



Thank you

Use of UNFC-2009 for Classifying Injection Projects - Update

Karin Ask
Manager, Corporate Reserves Management
kask@statoil.com
www.statoil.com

Statoil