

Hydrocarbons in the Netherlands

Diversity as the key to successful exploration

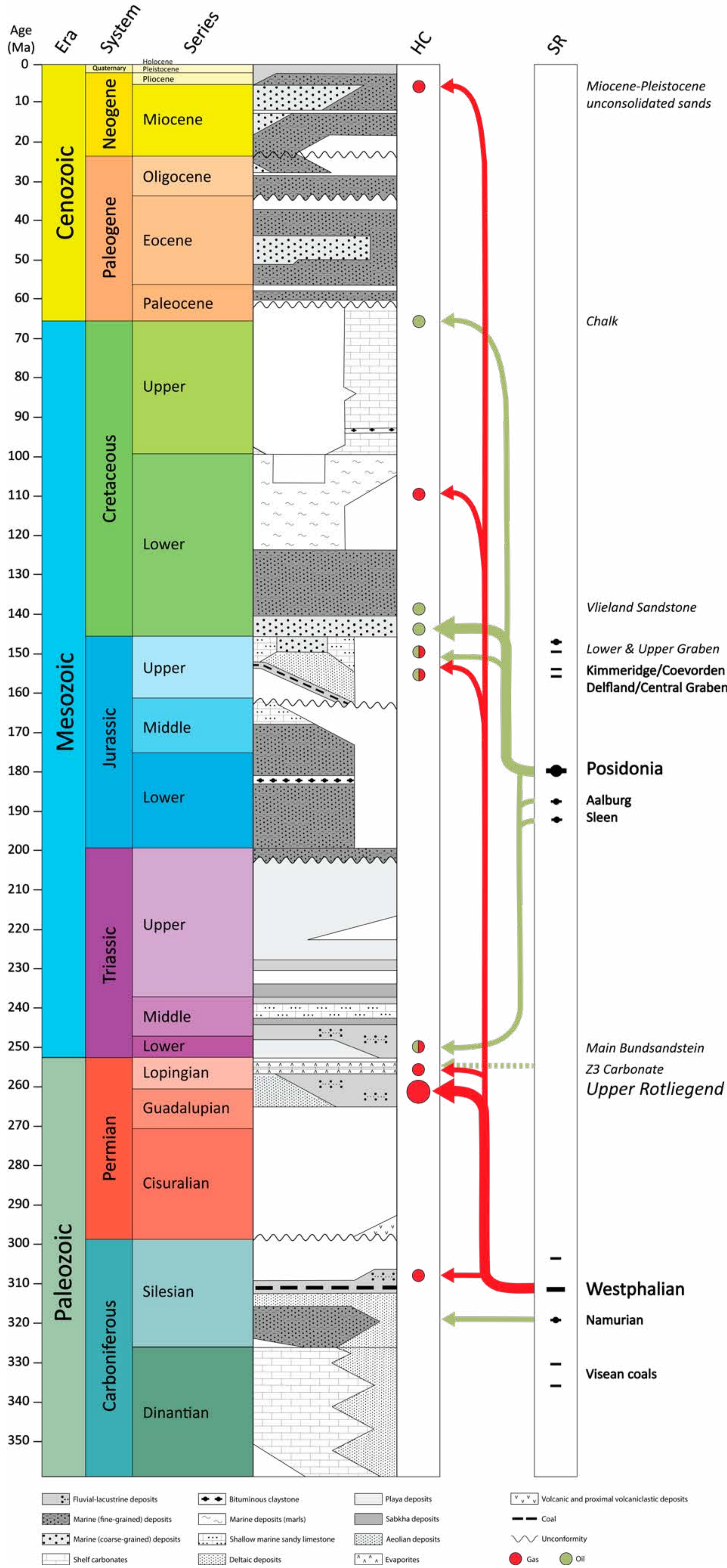


Figure 1. Hydrocarbon systems in the Dutch subsurface. The arrows show hydrocarbon migration into the main reservoir units (modified after de Jager & Geluk, 2007; Adrichem Boogaert & Kouwe, 1993-1997 and the Southern Permian Basin Atlas by Doornenbal and Stevenson, 2007).

Tertiary

- **Bright spots** are indicative of shallow gas presence
- High production rates
- More information on the “Shallow Gas” poster

Upper Cretaceous - Chalk

- A proven but underexplored play
- **Most important oil reservoir** (production since 2001 (F2-Hanze field))
- Challenging but rewarding play e.g. Rembrandt field (NL), Fife field (UK), Halfdan field (DK)
- Potential for intra-Chalk structural or stratigraphic traps
- > 55 untested closures in the northern Dutch offshore, of which > 30 in open acreage. STOIP from 10 - 300 MMbbls each

Jurassic

- Abundant oil and gas prospectivity
- Requiring dedicated geological studies

Triassic

- Volumetrically, the **second largest gas play** in the Netherlands e.g. F15-A field
- Significant hydrocarbon potential
- More information on the “Triassic Hydrocarbon Potential” poster

Rotliegend

- Volumetrically, the **most important gas play** in the Netherlands e.g. Groningen gasfield (2800 bcm)
- Still **new concepts** identified and proven e.g. Ruby and Cygnus plays
- More information on the “A New Upper Rotliegend Play” poster

Carboniferous

Upper Carboniferous

- The **Westphalian coals** are the principal **source rock for gas** and are present in most of the Dutch subsurface

Lower Carboniferous

- Virtually **untested and underexplored play**
- More information on the “Lower Carboniferous” poster

Dinantian Carbonates

- Underexplored play: the **Dinantian Carbonates** have recently become the **target of exploration** for both hydrocarbons and geothermal energy in the Netherlands
- Several prospects and leads identified, currently being pursued

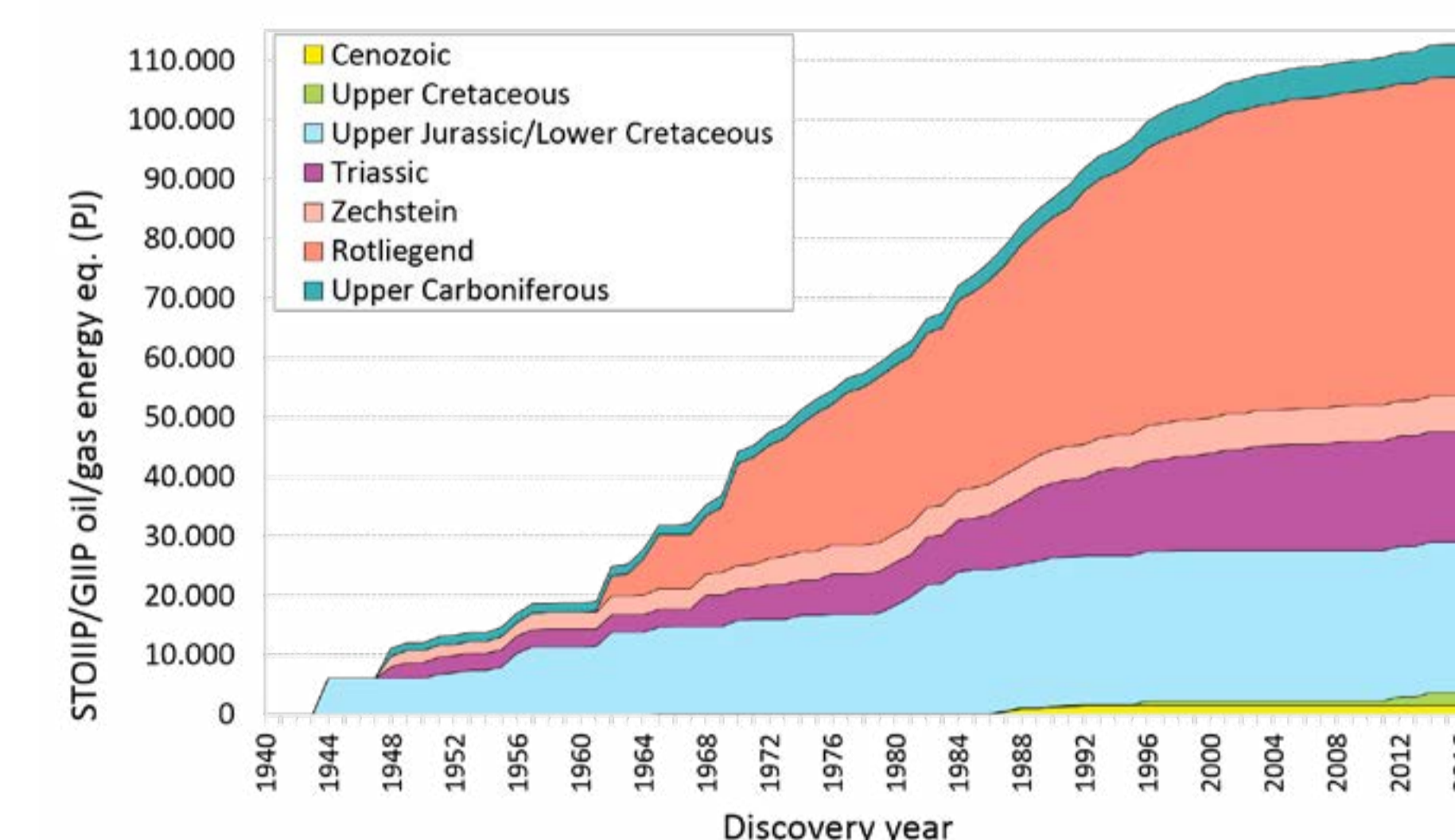


Figure 2. Cumulative energy (PJ) per lithostratigraphic unit in the Netherlands. Pseudo creaming curve (after Doornenbal et al., 2019 (expected publication)).

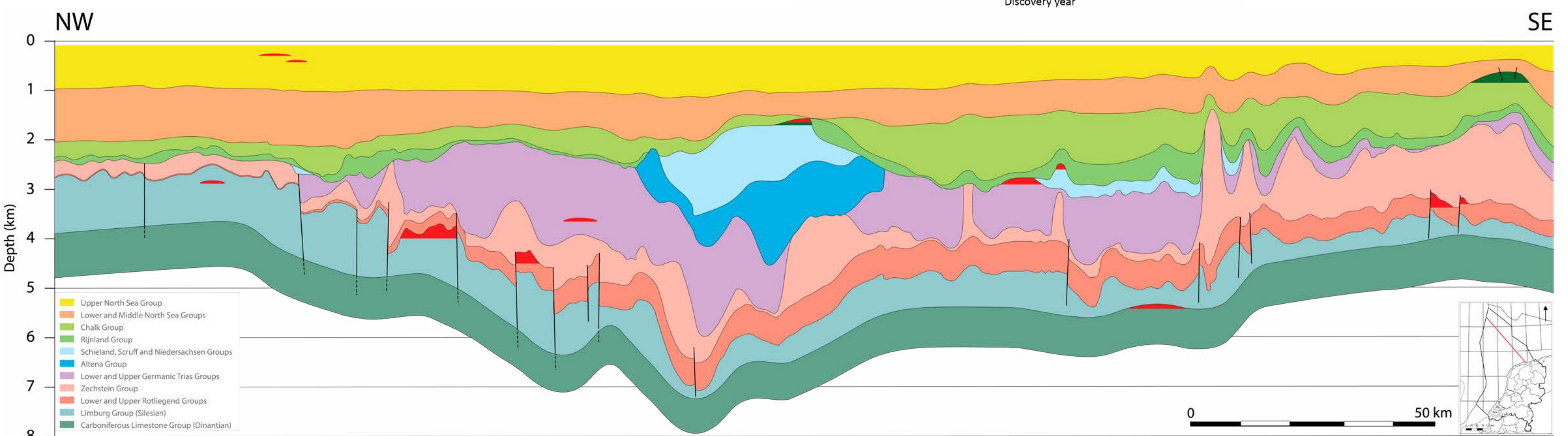


Figure 3. Schematic cross section through the northern Dutch offshore (modified after Duin et al., 2006).