Palaeoenvironments and palaeoclimate records in lacustrine deposits at the Eocene-Oligocene Transition. New insight from de CDB1 borehole (Rennes Basin, France)

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On behalf the CINERGY project, a 675m-long borehole was cored through the sedimentary column (405m) and the basement (270m).
The studied interval encompasses 3 lithostratigraphic units, from 66m to 405m depth. The chronostratigraphic framework of the sedimentary series relies on benthic foraminifera and palynology. Palaeoenvironmental reconstruction is based on sedimentology, pollen analysis and clay mineralogy.
The *Natica* Marls Fm (66-85m) is a lagoon-marine unit exhibiting metric sequences from restricted bay to salt marsh (schorre). Pollen grains, Mollusks and Dinocysts assemblages give a Rupelian age.
The Lower SapropelsFm (85-375m) is the thickest unit and exclusively made of lacustrine and palustrine clay deposits. Clays are either thinly laminated (varve-like) or massive, blocky with pedoturbation and/or brecciated fabric, alternating in thick (20-40m) sedimentary sequences. Both facies show varying organic content, up to 40% TOC. Pollen assemblages show a bimodal repartition between the laminated and massive facies. The former are interpreted as an open lacustrine system and the latter, as a closed lacustrine system whose floating mats vegetation, characterized by papyrus and lotus is typical of permanent flooded areas.
The first occurrence of the Early Rupelian marker *B. hohli* is observed at 195.13m. First results from magnetostratigraphy and cyclostratigraphy argue for an E/O boundary at ~202 m depth.The Eocene-Oligocene Transition is thus recorded in a detailed, continuous depositional environment.
The Chartres-de-BretagneFm (375-405m) corresponds to alternating sandy and clayey deposits. Depositional environments range from fluvio-lacustrine to fluvio-marine settings with occasional mangal development as attested by *Avicennia*.The formation is assigned to the Bartonian by benthic foraminifera and palynology. The lowermost samples yielded a 'Biarritzian' age, which is equivalent to the Early-Middle Bartonian.
The palynological record shows a gradual palaeoclimate change. The Bartonian is quite similar to the Lutetian of the Paris Basin, with a warm and humid "tropical" climate. The Early Priabonian, up to 278m, is still under humid and warm conditions, but development of herbaceous vegetation attests for a slight seasonality. During the Late Priabonian, a large development of Pinaceae coeval with a decrease in megathermic flora points to the EOT major climatic change. Indeed, Early Rupelian assemblages show even greater percentages in Pinaceae (above 50%) despite a steady lacustrine environment. The very last megathermic elements disappear at the base of the *Natica* Marls Fm.
The clay mineralogy evolution looks more abrupt. The clay assemblage from the Bartonian to the Late Priabonian is fully kaolinitic. The Early Rupelian assemblage is still dominated by the kaolinite but smectite appears in a significant amount (up to 60%). Whether the sudden

mineralogical change across de E/O boundary is related to a change in source material or to a change in the hydrolysis in soil clay production, a climatic origin is very likely.

Acknowledgements: This work was funded by Région Bretagne, CG35, Chartres-de-Bretagne, Rennes Métropole, IAV, SMG35, SMPBR, Préfecture de Bretagne, the BRGM, AELB and ADEME agencies.