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Zero carbon fuels

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Carbon is an essential component of hydrocarbons, which helps in ignition of the fuel, is bone of contention for the environmentalist, on account of release of CO, CO_2, NO_x and SO_2 emissions, when combustion takes place. Carbon separation and sequestration process have therefore been developed to resolve these problems. If hydrogen can be separated from hydrocarbon by the petroleum industry, fossil fuels can be turned to zero carbon fuels and petroleum industry can be turned to carbon free hydro industry and can contribute towards environmental conservation. Technological transition is required for utilization of hydro component of fossil fuels (Petrol, Diesel, Natural Gas) fuel in all energy generation process. An analysis of carbon based and carbon free hydrocarbon fuels is carried out for prospective hydro fuels processes and technologies existing so far, which leads to the possibility of development of subject fuels in the future.

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Inflow in the perforated slant gas well in the steady state

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Currently, gas and gas condensate fields are increasingly using horizontal and slant wells. During operation of such wells, it is important to choose the right production conditions, ensuring an extension of the water free production stage and preventing sand and water production, etc. At the design stage it is important to rationally design the wellbore profile, including the determination of the optimum length of the wellbore and the path through the formation. To calculate the inflow of gas to the slant well in a steady state, one must solve the Laplace equation for the formation entered by the perforated slant wellbore in combination with the gas flow equation for the perforated slant wellbore. The solution for the formation entered by the perforated well was found using a function of a fixed point flow, provided that there is the external boundary, which was modeled with image injection wells. The equation for developing the gas flow in a slant perforated wellbore was obtained with consideration of local and hydraulic resistance in the wellbore. We have obtained a system of equations, solution of which allows finding the unknown flow rates of each perforation. Developed software allows determining the inflow profile, flow rate along the hole and the pressure drop in the borehole for the various modes of operation and different number of perforation intervals. Besides, it is possible to model operation of an intellectual well with adjustable filters (perforation intervals). Opening and closing of filters is modeled by the change of perforation density of intervals.

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