There are about 700 oil refineries all over the world today, but - like oil - they are not equally distributed in all parts of the world. Their representation by location is greatly determined by several crucial factors; vicinity of oil sources, vicinity of intense oil products consumption or population density, vicinity of oil transportation routes, economic potential for refinery construction, etc. In turn, refineries mutually differ by type and complexity of oil refining technologies (refinery complexity), installed and utilized oil refining capacity, and more recently by technological potential for obtaining highly purified oil products and highly treated refinery emissions.

In addition to the global and regional survey of locations and refinery numbers, the paper covers their main characteristics in the period from 1996 onwards, bringing to the fore general trends of changes and global tendencies of such changes in this branch of industry.

Although availability of data on existing refineries is not simple and equal for all parts of the world, thanks to the efforts invested in data acquisition they provide a picture of global situation and balance for this industry and illustrate its changes and trends. Comparison of individual characteristic refineries with average or extreme ones in the world or in the region also becomes possible.

Key words: number of refineries, installed refinery capacity, utilized refinery capacity, conversion refinery capacity, refinery complexity

1. INTRODUCTION

Oil refineries are the basis of the industry branch called oil refining, where oil products are obtained by oil processing.

In the last several years the number of oil refineries in the world stands at about 700, and their products satisfy the demand of the modern world. In difference to the preceding period, this period is not characterized by refinery number growth trend, but primarily by certain stagnation caused by limited geological oil reserves and production capacities on the one hand and more rational utilization of refinery capacities and consumption of refinery products on the other hand.

The paper presents a global and local survey of refinery numbers and locations, as well as their basic characteristics in the period from 1996 onwards, showing general trends of changes and global tendencies of these changes in this branch of industry.

2. Number of world oil refineries

The recent turn of the millennium is characterized by inflection of growth of world oil refineries into a slight decrease, as illustrated in Table 1, which shows the number of refineries by world regions from 1996 until 2008.

It is evident that strongly decreasing trends in Western and Central Europe and North America caused a global decrease in refinery numbers. In the last ten to fifteen years pronounced changes are absent in refinery numbers in other regions.

3. Installed world refining capacities

It is interesting that the situation and balance of installed refinery capacities is not proportionate to the number of refineries in the same period. It is well illustrated in Table 2 on regional representation of installed refinery capacities from 1996 until now, which clearly shows an increase, but without any indications of inflexion towards possible decrease.
Average refinery capacities by region in the period from 1996 until 2008 are shown in Diagram 1.3,7

It is interesting that most regions of the world show gradual increase of average refinery capacities in the investigated period, while Central Asia and East Europe in particular show a stronger decrease, subsequently followed by gradual increase of average refinery capacities.7,8

### 4. World refinery utilization

Utilization of refinery capacities in practice is necessarily functionally related to installed capacities and is mutually proportionate for the same periods, but not with the same intensity in all regions, nor with equal accent in each of the presented periods, as shown in Table 3 which refers to world refinery crude runs from 1996 until 2008.

Differences in utilization of installed refinery capacities by region are particularly well displayed in Table 4, which interprets the percentage of practically utilized installed capacities. It is evident that utilization percentage of installed refinery capacities is high in the Middle East, North and Latin America, Western and Central Europe, Asia and the Pacific. It is followed by Africa, while East Europe and Central Asia are at the end of the list.1,4

### 5. World refinery complexity

Alongside with human potential, the basic precondition for competitive strength of a refinery is structure and participation of conversion processes in its total processing capacities.8,10,13 Table 5 shows the balance of total refinery conversion capacities by above mentioned regions in the period from 1996 to 2008.
Table 6 shows complexity ratio as percentage of refinery conversion capacities in total refinery (distillation) capacity by world regions in the period from 1996 to 2008, and much better interprets regional differences for periods under review.8,9,13

North American refineries have the highest average complexity ratios, which are significantly above those in other world regions. Refineries in Asia and the Pacific, Latin America and Western and Central Europe have average levels of complexity ratios, while Central Asian, African and at the very end Eastern European refineries have the lowest average complexity ratios.11,12

Interestingly, North American refineries have not shown any trend of further complexity ratio increase in the last decade, while regions with average ratio levels have the most intensive growth trend. If the existing trend continues in the following years, global changes towards convergence of regions with refineries of average complexity ratios and highly-complex North American refineries can be expected, as well as bipolarization due to further lagging of regions with low complexity ratios, with possible exception of Africa, if the trend realized in this millennium continues.

<table>
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