

HSSE (Health, Safety, Security and Environment) Philosophy and Environmental Policy

February 7, 2019





About TOA Oil Co., Ltd.

TOA Oil is an energy company that operates oil refinery and electric power generation facilities in the coastal region of Kawasaki City.

Oil Refinery

Our refinery facilities boast high-efficiency oil separation and refinement equipment, which enable us to process some of Japan's heaviest crude and stock oils and produce uniquely high-value-added petroleum products.

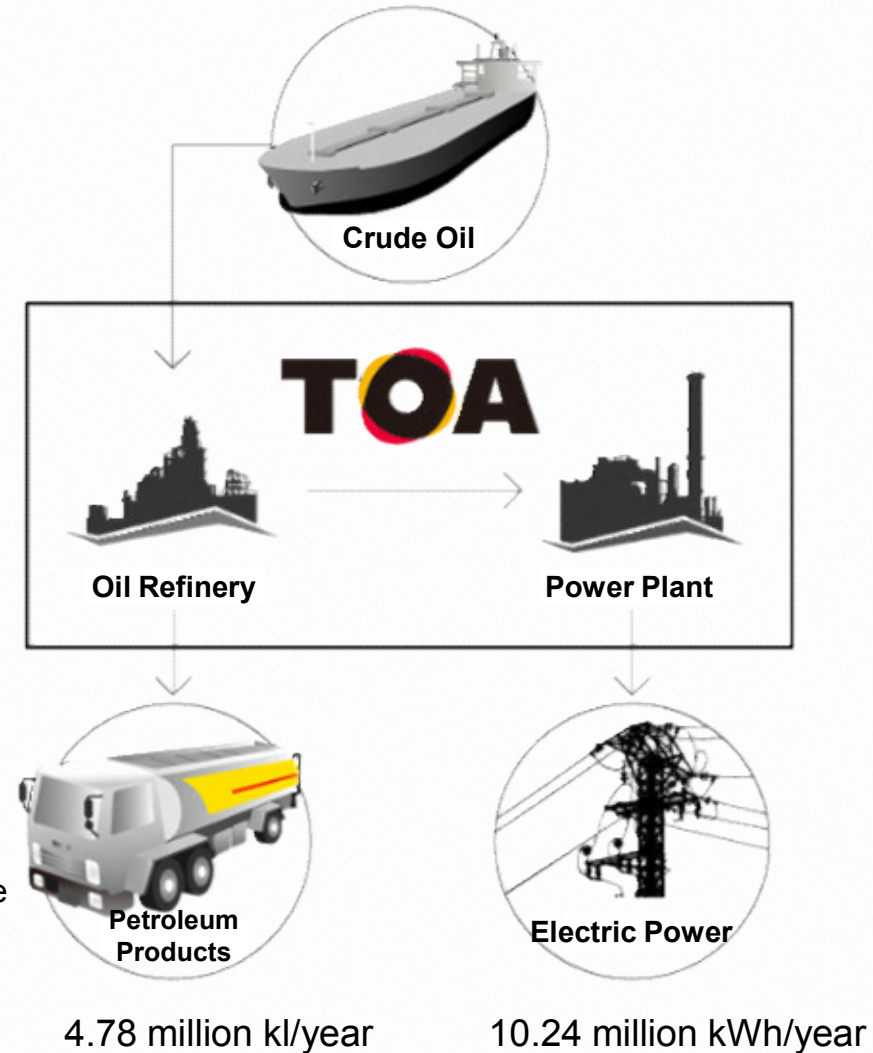
Power Plant

We utilize byproduct gases, residual oils and other such products from refining processes to produce electric power for use in the Tokyo capital region, which is a major electric power consumer.

Foundation: 1924

Headquarters and Plant Location: Kawasaki City,
Kanagawa Prefecture

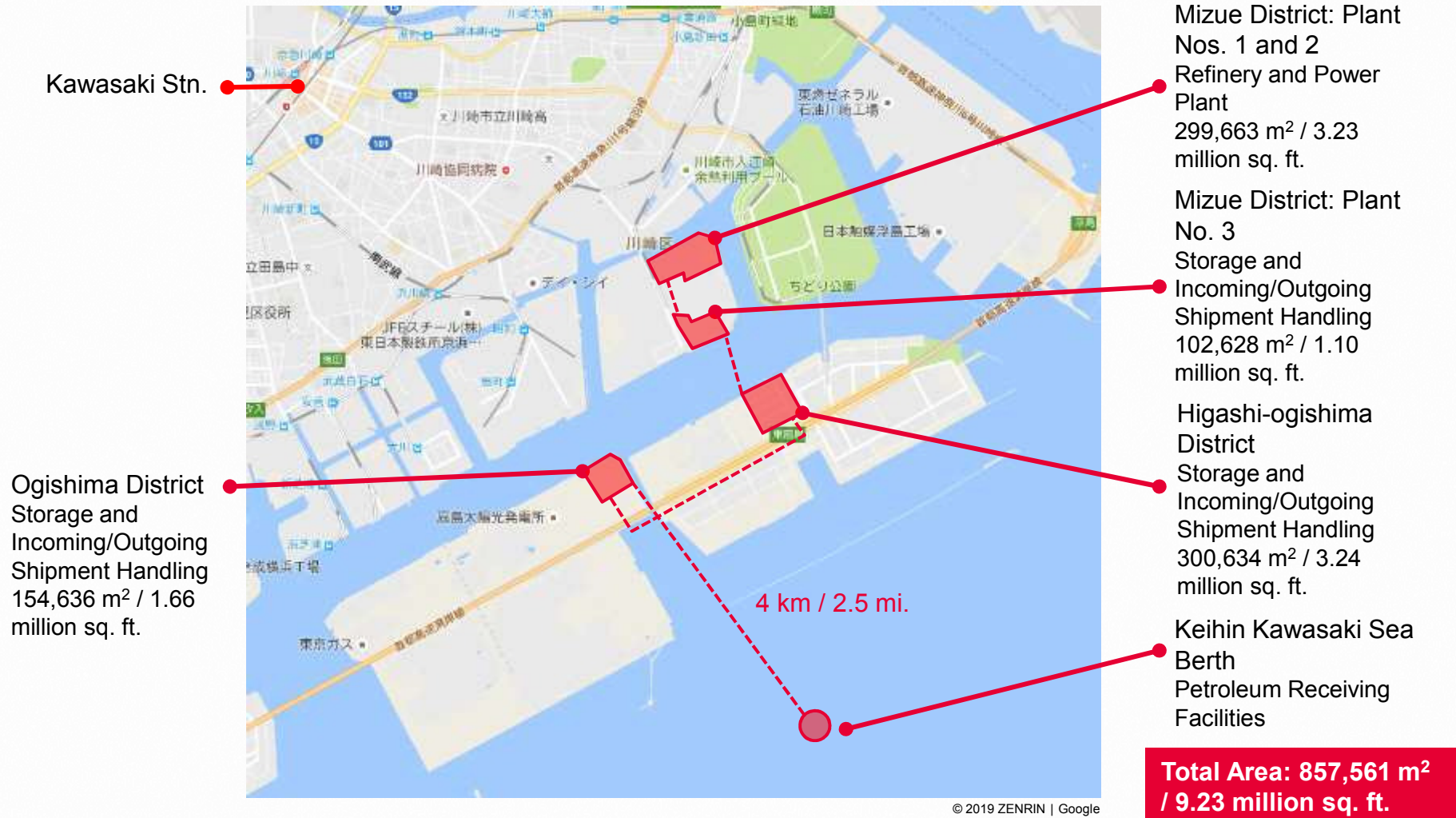
Number of Employees: 520





Production Facilities

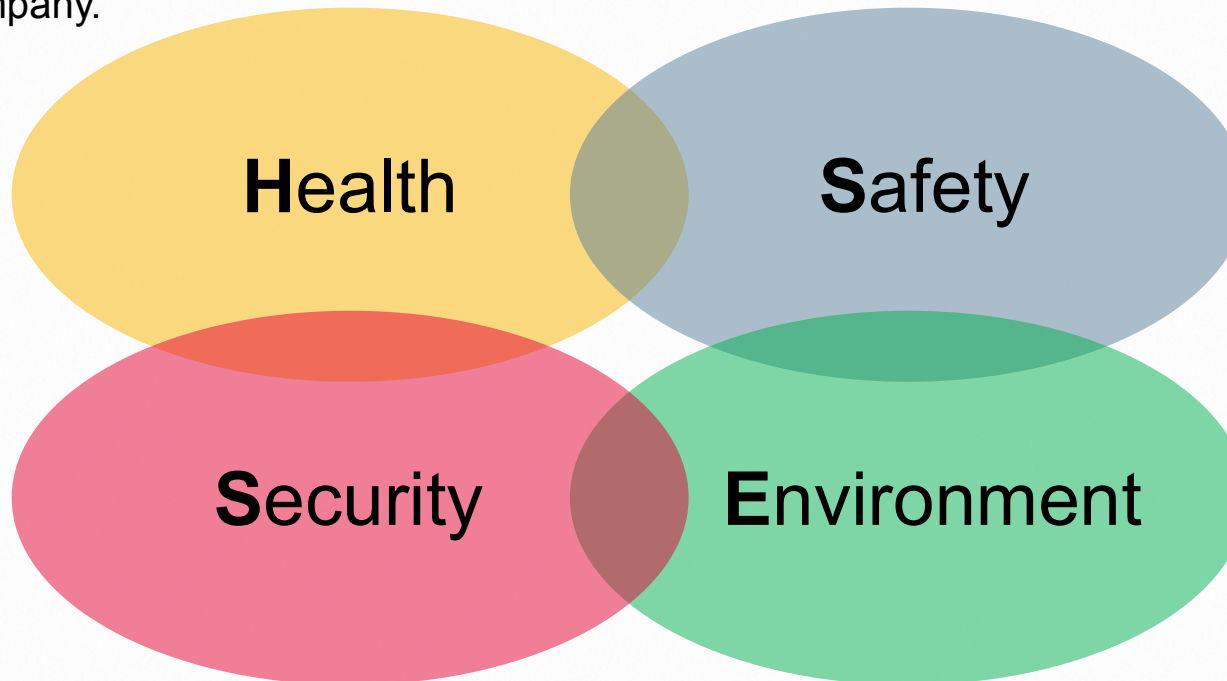
Both our corporate headquarters and refinery are in Kawasaki City, and we carry out production and shipping operations in four locations within Kawasaki Ward's Mizue-cho, Higashi-ogishima and Ogishima districts.





Our HSSE Philosophy

- In order to achieve sustainable company operations, we strive to realize all aspects of the HSSE philosophy—health, safety, security and environment—which we consider to be an integral part of our corporate social responsibility.
- By positioning HSSE as the foundation of our management activities, including it as the first of our management principles, and utilizing our corporate management system in all activities, we are able to earn the trust of customers and achieve sustainable growth as a company.



Today we will be taking a look at environmental preservation measures.



Pollution in Kawasaki and TOA Oil's Environmental Policy

- The Keihin (Tokyo–Yokohama) industrial region, with Kawasaki at its center, played a major role in achieving high-speed economic growth in postwar, 20th-century Japan. However, this came at the price of widespread and harmful pollution.
- In 1955, TOA Oil established its first refinery in Kawasaki and began refining operations. We expanded our facilities as Japan's economy grew, and even though we were guilty of being one of the Keihin area's polluters, we became aware of the problem and made it a top priority to adhere to government-imposed pollution regulations. Based on this way of thinking, we developed a unique environmental management system and utilized it in our environmental protection measures.
- In light of these developments, we established the following Environmental Policy based on the HSSE principles.



1955: TOA Oil's first refinery (6,000 barrels/day)

Environmental Policy

- (1) Obey environmental law and adhere to other regulations and requirements in all corporate activities
- (2) Pursue continual improvements to our environmental management system and utilize creative ideas and technological innovations to prevent pollution of the regional and global environments and reduce our environmental load
- (3) Strive to achieve greater resource and energy savings while pursuing more reliable provision of trustworthy products in an efficient, safe and environmentally friendly manner
- (4) Ensure that all company personnel understand this policy from the outset, and personally fully comprehend the importance of environmental preservation and proactively take action



Continual Reductions to Environmental Load (Environmental Accounting)

- Based on the core concepts of continual improvement, creative ideas and technological innovation, we strive to achieve continual reductions in our company's environmental load.

Category	Activities	Investment Amounts and Expenses
Environmental preservation	Pollution prevention	420
	Global-scale environmental preservation	30
	Resource recycling	90
Environmental load reduction	Reduction of benzene amounts in products Reduction of sulfur amounts in products	10,400
Management efforts	Environmental management system Green space creation	40
Social efforts	Port facility improvements	2
Environmental damage	Insurance Installation of preventive equipment/facilities	20
Total		11,002

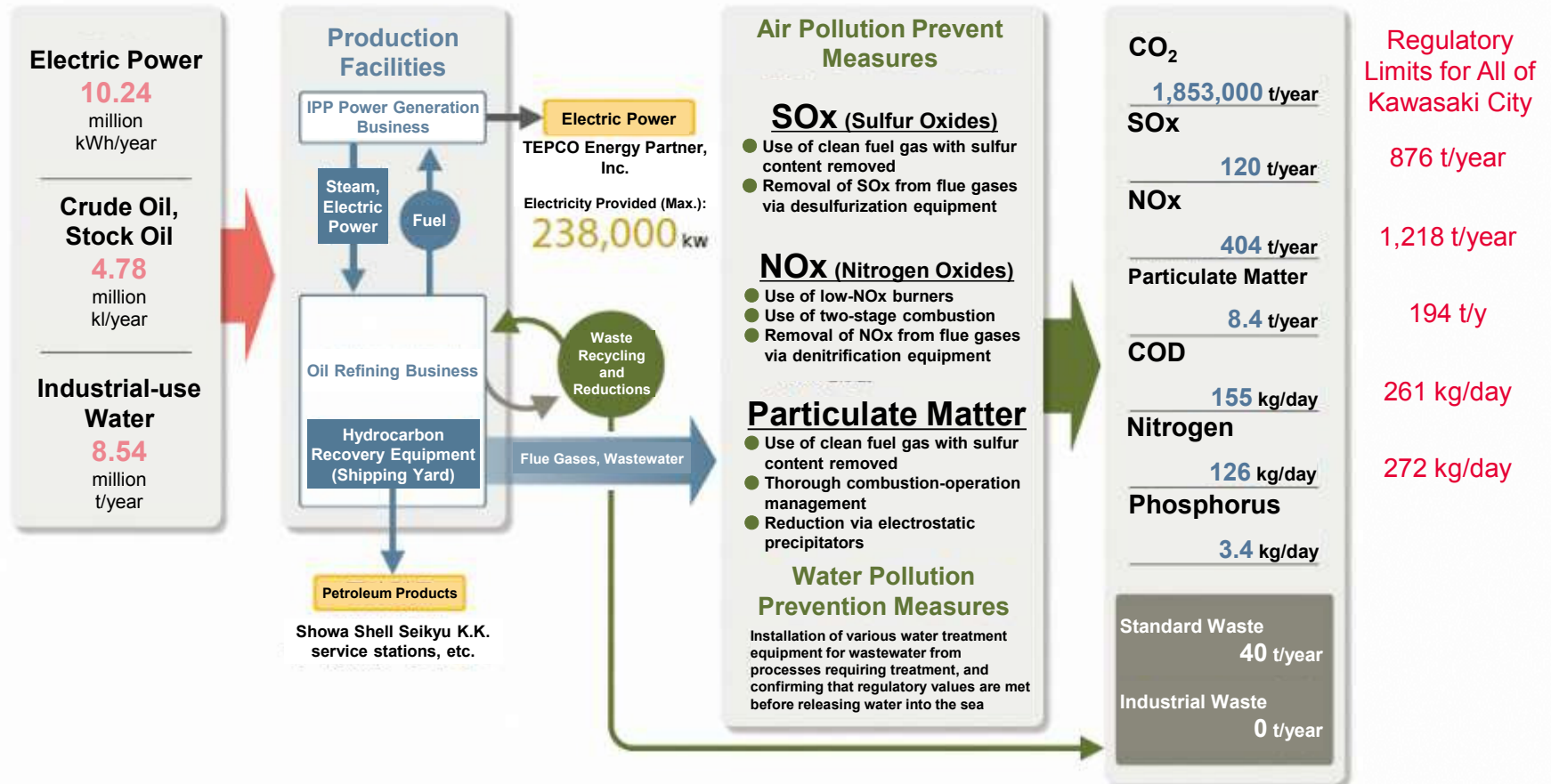
Above figure are 2017 results

Unit: millions of yen

Created based on MOE's Environmental Accounting Guidelines 2005



Reductions in Environmentally Hazardous Substances

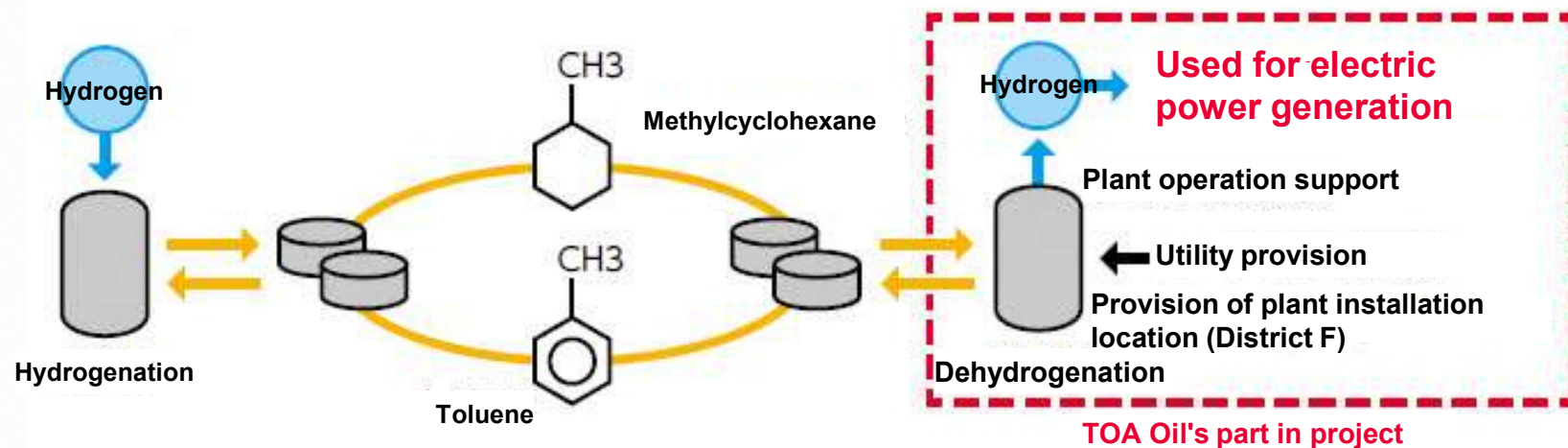


- In addition to adhering to official regulatory limits, we have always established ambitious targets for environmental assessments and reduced amounts of hazardous substances to the greatest degree possible through our management system. The above figures, which we make available to the public, are the results of these efforts.
- Despite being a petroleum company, we do not approve of commuting to work by car for employees at TOA Oil and partner companies, and we even attempt to reduce pollution through activities not directly connected to production operations.



New Measure: Participation in the Hydrogen Supply Chain Proof-of-concept Project

TOA Oil is participating in the New Energy and Industrial Technology Development Organization (NEDO) "Hydrogen Supply Chain Proof-of-concept Project for Unutilized Hydrogen Fuel via the Organic Chemical Hydride Method." This concept-demonstration project is being carried out by the Advanced Hydrogen Energy Chain Association for Technology Development (AHEAD), which was founded by Chiyoda Corporation, Mitsubishi Corporation, Mitsui & Co., Ltd. and Nippon Yusen K.K. (NYK Line).



- Through this NEDO proof-of-concept project, hydrogen is taken from gases generated by processes at a natural gas liquefaction plant in Brunei, then transported by sea to Japan and utilized to cover a portion of the fuel required for electric power generation.
- Prior to marine transport, toluene is added to the hydrogen to form methylcyclohexane. In this form, the hydrogen is reduced to 1/500 the normal volume and can be safely transported by ship at standard temperatures and pressures.
- In Japan, the toluene and hydrogen is separated out from the methylcyclohexane at a dehydrogenation plant (currently being built) within TOA Oil's facilities, after which the hydrogen is used for power generation and the toluene is shipped back to Brunei.
- The hydrogen separated out at the TOA Oil dehydrogenation plant is used to cover a portion of the fuel needed for power generation operations. The resulting electric power, generated using hydrogen imported from overseas, is then supplied to the Tokyo capital region for one year's time.



In Closing: Operational and Environmental Measures at TOA Oil Refinery and Power Plant Facilities

We have begun construction of the dehydrogenation plant to be used in the Hydrogen Supply Chain Proof-of-concept Project.

In 2020, we will use the hydrogen supplied by the dehydrogenation plant to cover part of the fuel required for electric power generation operations.

This is the first system in the world to generate power using hydrogen imported from abroad, and we will utilize the system to supply the Tokyo capital region with electric power for one year's time.

If you have a chance, please stop by and take a tour of our plant!



Simulated image of completed project plant

Here at TOA Oil, we are serious about reducing our environmental load.

Moving forward, we intend to make full use of all available technological innovations along with creative ideas to continually reduce our company's environmental load to the greatest extent possible, while providing society with the energy it needs in the forms of oil and electric power.

Thank you for your time!

