CORPORATE RESEARCH PROGRAM IN CLIMATE/CO_2-GREENHOUSE

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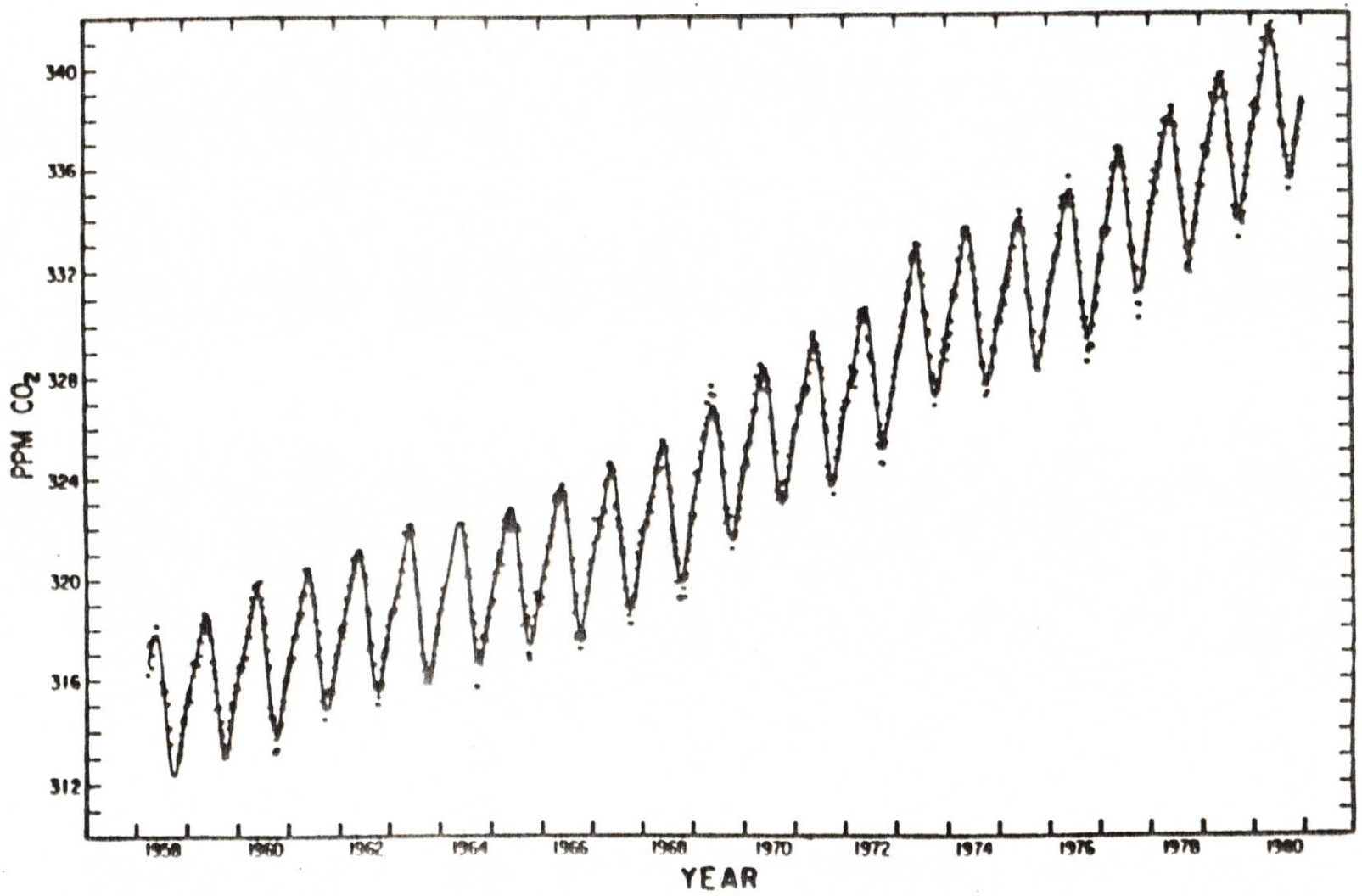
CORPORATE RESEARCH PROGRAM

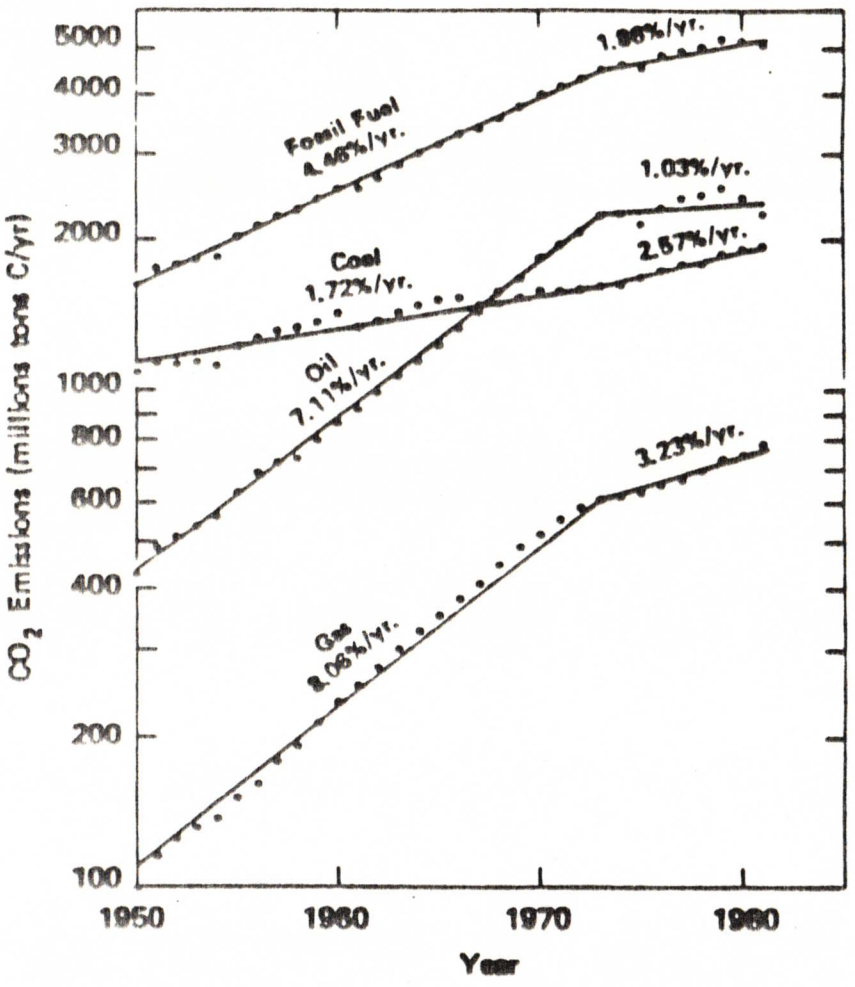
- OBJECTIVES
  - PROVIDE EXXON WITH A SOURCE OF EXPERTISE IN AN AREA WHICH COULD HAVE MAJOR IMPACT ON FUTURE BUSINESS ENVIRONMENT
  - HELP STIMULATE AND CONTRIBUTE TO A BROAD SCIENTIFIC INVESTIGATION OF CO_2 EFFECTS

- APPROACHES
  - ESTABLISH A SCIENTIFIC PRESENCE THROUGH RESEARCH PROGRAM IN CLIMATE MODELING
  - SELECTIVE SUPPORT OF OUTSIDE ACTIVITIES
  - MAINTAIN AWARENESS OF NEW SCIENTIFIC DEVELOPMENTS

CONCENTRATION OF ATMOSPHERIC CO_2 AT MAUNA LOA OBSERVATORY, HAWAII

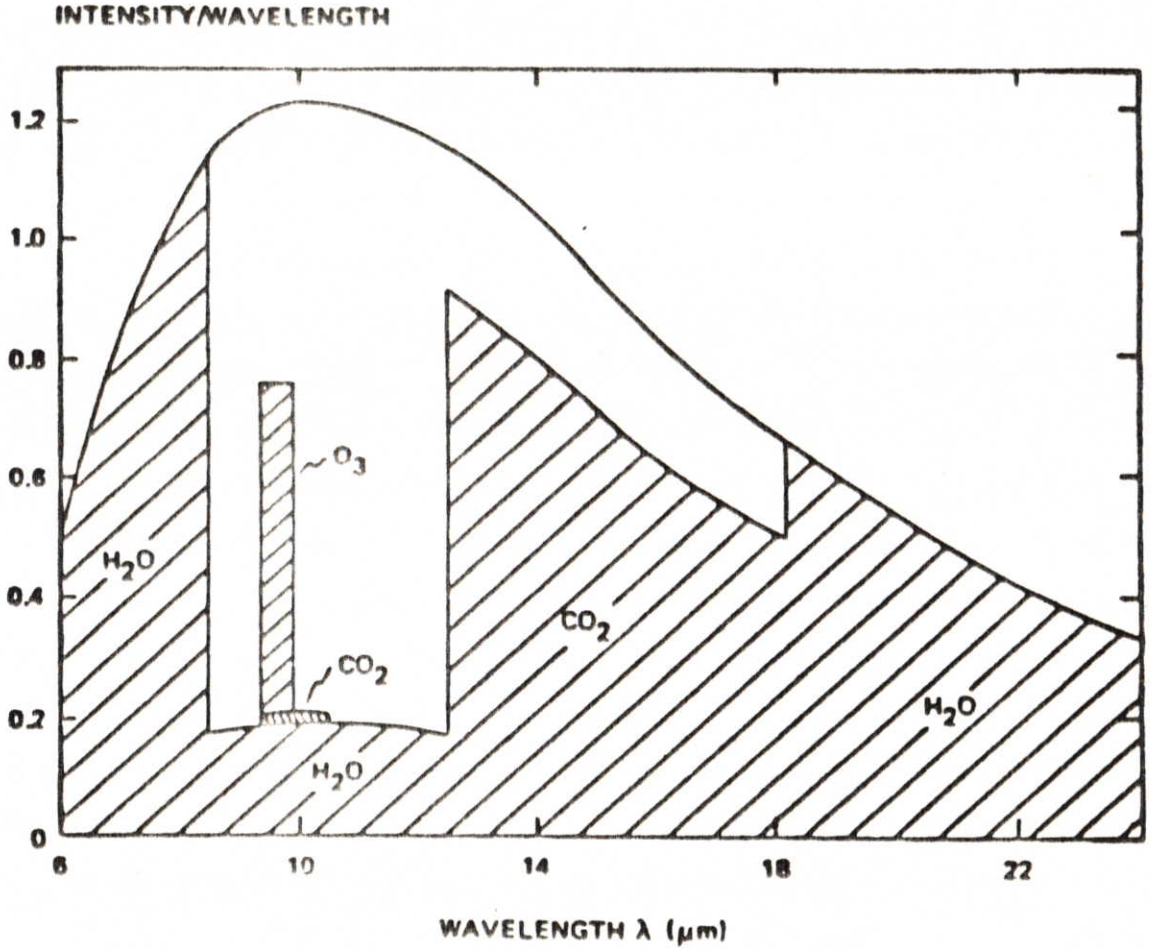


INDUSTRIAL CO_2 PRODUCTION



BASIS FOR CO_2-GREENHOUSE EFFECT

- ATMOSPHERIC ABSORPTION OF INFRARED RADIATION INCREASES EARTH's TEMPERATURE BY ~35°K
- INCREASING CO_2 AND OTHER TRACE GASES ABSORB IN THE REMAINING ATMOSPHERIC WINDOWS



ROLE OF MATHEMATICAL MODELING

- MODELS ARE BEING USED TO EXPLORE PHYSICAL EFFECTS (SCENARIOS) AND AS A PREDICTIVE TOOL
  - CARBON CYCLE MODELING TO DETERMINE FATE OF FOSSIL-FUEL CO_2 EMISSIONS
  - CLIMATE MODELING TO STUDY EFFECTS OF ATMOSPHERIC CO_2 INCREASES ON THE EARTH'S CLIMATE

- VALIDITY OF MODELS NOT ESTABLISHED
  - COMPLEXITY OF CARBON CYCLE AND CLIMATE SYSTEM REQUIRE MANY APPROXIMATIONS AND PARAMETERIZATIONS
  - GEOLOGICAL AND HISTORICAL DATA ARE INADEQUATE FOR VALIDATION OF MODELS