1. INTRODUCTION

Over the past 30 years, increasing fuel prices and climate change have raised general concerns about the health of environment and the use of natural resources. It is undeniable that ensuring an energy supply for a growing world is one of the major challenges mankind now faces. However, providing drinking water to each of the world's 6.6 billion inhabitants is, at least, as proprietary as supplying energy to power our lives. Men can live without cars, but would die without food or water. Great effort has been put into finding new sources of energy supply (e.g. solar, wind, co-generation facilities, etc) but now it is time to change our focus and start thinking more about water supply.

Ideally, water should be supplied through a system that would cause the least environmental damage and would be the most cost-effective at the same time. Unfortunately, such a perfect water supply system is usually unavailable and thus, water planners must find a compromise between environmental impact and cost. On top of that, water resources planning is strongly linked to socio-economic factors; urbanization, industry and agriculture can only exist where water is made available. Therefore finding the optimal water supply system is not only a question of technology but actually involves strong political and economical interests. The role of water engineers is to understand both technical and human concerns of water resources in order to build the best solution for the environment and the people. Actually, the optimal water supply systems consists not only of one, but a combination of several different water sources.

According to the United Nations Human Development Report 2006, for 1.1 billion people around the world, water resources are unreliable, unsafe or beyond their purchasing power. This is not the case in California or Spain where 100 percent of both populations have access to potable water and one easily spends four times more money for cell phone use than for one's water bill. Moreover, water is often squandered as a result of inefficient use and network losses, which in Spain account up to 20% of total supply. This does not mean, however, that water is abundant. In fact, it is quite the contrary. Water resources in Spain and California are rather scarce and highly vulnerable. Conversely, these populations and their economies have been constantly growing over the past decades and will certainly continue to do so for the next thirty years.

In order to support such high a level of development without compromising their natural resources, California and Spain are trying to build a diversified water supply portfolio that would lessen the pressure on the environment and would be affordable at the same time. The formula includes many different sources of supply and their combination varies in time and space according to availability and demand. This thesis will focus on five major water management practices: 1) urban water conservation, 2) agricultural water use efficiency, 3) water recycling, 4) conjunctive use of surface and groundwater and 5) desalination. Both California and Spain are using each of the five management tools, although at different level of implementation. To summarize, we will point out the most relevant conclusions and we will also specify recommendations that should be followed by each region in order to improve water management.

I have picked California and Spain to develop this comparison because of the numerous similarities between both regions. From the geoclimatic perspective, California and Spain. Have the same Mediterranean Climate, which means dry summers and sporadic rains the rest of the year. California and Spain also share similar characteristics in terms of water availability and also comparable challenges as regards water supply and demand. Both in California and Spain surface water resources are concentrated in the north, while water demand is mostly located in the dry central and southern regions. Since the 1800's California and Spain have been dedicated to the construction of major water infrastructures including dams and conveyance facilities. However, over the past decade, advanced water treatment plants, innovative storage systems and efficient water use devices are replacing traditional hydraulic works.