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12 March 2009

The Hon. George Pullicino A.& C.E.
Minister for Resources and Rural Affairs
Barriera Wharf
Valletta

Climate Change Consultation Process

Reference is made to the **National Strategy for Policy and Abatement Measures Relating to the Reduction of Greenhouse Gas Emissions** which has been made available for public consultation.

As my expertise lies principally in the water and waste management sectors, I have chosen to focus on these two areas. Notwithstanding, being a member of the academic staff of the University of Malta, I have also sought to reconcile how climate change issues can also feature in our educational system.

I hope that through this short note, I can bring to light certain issues in these sectors which could add value to the current consultation document such that a 360 degree outlook on all parameters that contribute towards climate change can be developed.

Should you wish to discuss any of these matters further, please do not hesitate to contact me.

Yours sincerely

(Perit) Kevin Gatt

Comments to Climate Change Strategy

This short paper is mainly aimed to comment on the water and waste management issues that are contemplated in the consultation document as well as to propose other aspects which have not been considered.

Water Resources

There is no doubt that the Maltese Islands have a water deficit. This is evident from the balance between groundwater and desalinated water which together constitute our drinking water. Since the early eighties, Malta has had to resort to desalination in order to ensure that the local population is adequately served with its needs both in terms of quality and quantity.

Over the years, desalinated water has contributed to levels which have now reached the 54% mark (approx.) of total water production. This has meant that the energy demand of water production has increased and now approximates around 6% of total energy production. Even if this may seem as a small percentage of Malta's total energy consumption, one cannot not agree that the impacts on GHG emissions exists.

However, there is another important facet which needs to be factored. The IPCC Fourth Assessment Report 2007 (FAR) clearly states that warming of the climate system is unequivocal as evidenced from observations of increases in global average air and ocean temperatures and average sea level amongst other parameters. The report states that eleven of the last twelve years (1995-2006) rank among the twelve warmest years in the instrumental record of global surface temperature (since 1850) with a 100-year linear trend (1906-2005) of 0.74 [0.56 to 0.92] °C which is larger than the corresponding trend of 0.6 [0.4 to 0.8]°C (1901-2000) given in the Third Assessment Report (TAR). Global average sea level has risen since 1961 at an average rate of 1.8 [1.3 to 2.3] mm/yr and since 1993 at 3.1 [2.4 to 3.8] mm/yr, with contributions from thermal expansion, melting glaciers and ice caps, and the polar ice sheets. Whether the faster rate for 1993 to 2003 reflects decadal variation or an increase in the longer-term trend is unclear.

The FAR observes that between 1900 to 2005 precipitation quantities declined in the Mediterranean with the global area affected by drought likely to have increased since the 1970s. It is also very likely that over the past 50 years: cold days, cold nights and frosts have become less frequent over most land areas, and hot days and hot nights have become more frequent. It is also likely that heat waves have become more frequent over most land areas, the frequency of heavy precipitation events has increased over most areas, and since 1975 the incidence of extreme high sea level has increased worldwide. Average Northern Hemisphere temperatures during the second half of the 20th century were *very likely* higher than during any other 50-year period in the last 500 years and *likely* the highest in at least the past 1300 years.

Malta's Water Resources Review (FAO, 2006) makes some interesting observations. It warns that whilst there is no compelling statistical evidence of climate change affecting the water resources of the Maltese Islands, there is a risk that climate change will become a serious issue in the future. This comprehensive Review states that in a scenario where the sea level of the Mediterranean Sea is expected to rise by up to 96 cm by 2100 a consequential rise in the freshwater lens will occur which will have a negative effect on the abstraction stations in the sea-level aquifers.

It is in this context that the ongoing changes are seen to have potential wide ranging effects on water resources in Malta namely:

- lower annual rainfall volumes contributing to lower volumes of freshwater resources increasing Malta's dependence on desalinated water;
- variability in inter-annual and intra-annual rainfall;
- seasonal scarcity of precipitation when the water requirements of the agriculture and tourism sectors are highest (normally from June to August);
- high rainfall intensity events, with shorter durations, having a lower contributing effect to recharging groundwater resources;
 - o frequent occurrence of low rainfall years when groundwater recharge is likely to be low;
 - o frequent occurrence of high rainfall years when runoff is likely to be high;
- increased demands for water resources to combat the effects of higher temperatures;
- higher evapotranspiration rates that will demand increased water volumes for cultivated areas;
- increased salinity of groundwater resources as sea water levels rise and salty water replaces freshwater sources.

The proposed Climate Change Strategy, in terms of water resources, puts forward the following main proposals:

1. Recommendation 19 (in part) – on the strengthening of organizational capacity for R&D*1 in water utilities;
2. Recommendation 25 (in part) – on the implementation of smart water meters;
3. Recommendation 56 – legislation to enforce reservoirs/wells;
4. Recommendation 57 – subsidy for second class water systems;
5. Recommendation 62 – reuse of treated effluent.

It is my personal opinion that the proposed strategy does not go the full way into recognizing the severity of our situation in terms of water resources and to put forward proposals that will address the predicted onset of water-related scenarios listed here above. In particular due attention must be given to the need for a new agricultural dimension as well as a responsive infrastructure that permits and encourages the capture of stormwater runoff for subsequent enhanced recharge. A gap analysis of the proposed recommendations *vis a vis* the climate change implications on water resources is suggested to be undertaken with a view to address such gaps and put forward concrete proposals to address such.

It would also have been a positive development to put forward a proposed direction for Malta's Water Policy as had been outlined in the draft document A Water Policy for the Future and which now dates back to 2004.

Furthermore, it would also have been appropriate for the Strategy to have taken stock of the proposals that has been developed in Malta's First Communication to the UNFCCC in order to determine their validity and elaborate or embrace such proposals into this document where these have not yet been fulfilled.

Additionally it is to be noted that some measures which point towards addressing the more efficient use of energy could have also reflected the parallel need for the efficient use of water. In particular, the differentiated tariffs proposed in recommendation 29 for electricity should also be extended to water. This will contribute towards lowering peak demands as well as narrowing peak and trough demands with a resultant reduction in leakages and stresses on existing infrastructure.

Similarly, Recommendations 39 and 40 deal on the educational aspect and the sharpening of the focus on energy-efficient education. Whilst one recognizes the large contribution that energy consumption has towards GHG emissions, it is important to view the educational aspect of climate change from a holistic viewpoint integrating other areas such as water, land use, transport and energy into the areas where this sharpening of educational focus is required.

Waste Management

Waste management may be divided into solid and liquid waste management.

The publication of the revised Solid Waste Management Strategy does not feature strongly in the draft document. Although this may be due to the fact that the Climate Change Strategy document was published before that for waste, it is now known that there are more initiatives in the latter document which contribute towards improving climate change scenarios.

Hence it is suggested that Recommendations 58-61 be remoulded into a singular, and more expanded, recommendation which describes the revised Strategy and, possibly without committing itself to the specifics, picks out on those elements of the Strategy which will positively impact climate change scenarios.

From a liquid waste management perspective, although due consideration has been given to sewage as a waste water, no specific consideration has been given to stormwater runoff as a form of waste water.

One also needs to be careful in respect of putting forward direct proposals for the use of treated effluent for agricultural purposes. Health authorities have always treaded with caution on this issue and the use of treated effluent for irrigation was not allowed on areas that fall within the groundwater protection zone. Hence whilst the use could be more actively pursued for industry and outside the groundwater zone, blanket statements should be made with a great deal of caution. Furthermore, one needs to undertake a cost benefit analysis to determine whether the infrastructure required is justified in terms of its cost-benefit implications.

Education

Recommendations 39 and 40 focus on the educational priority to be given at both undergraduate and postgraduate levels for enhancing the curriculum related to energy-efficient building design. It is thought that this approach can be easily widened to focus on climate change issues in general rather than a specific portion of our environment namely the built environment. Whilst recognizing that the latter can play a considerable role in our context, we need to be more holistic, in an academic sense, with a view to ensure that there is an academic following throughout the spectrum of climate change.

The Faculty of the Built Environment can be a major player in this field as can also be the Faculties responsible for Engineering, Education and Science. However it is important for curricula to address specific needs and for resources at the University to be shared, if necessary, in order to provide a holistic coverage on the subject.

A look at SEC students electing to sit for Environmental Studies paints a dim picture of the future generation's grounding in environmental issues. Hence whilst it is important to factor in environmental education into our national curriculum it is important to look at other strategic issues that could look at various options that could include the:

- mandatory requirement of environmental studies for progression to post secondary education;
- the gearing of the systems of knowledge course to factor in the environmental dimension;
- to create a culture of environmental awareness across the spectrum as has been done so successfully in the waste management sector and to entrench this as part of the curriculum.

Other options might exist, but the aforementioned are aimed at giving a flavour of the direction that is being suggested in order to ensure effective environmental education.

Organisational Issues

The proposed text puts forward a number of suggestions to reinforce the organizational dimension related to the implementation of climate change initiatives. I am of the opinion that climate change is of a horizontal nature and that consequently it requires the input of as many stakeholders as possible. Notwithstanding, it is a demanding science which is resource intensive within a market in which such resources are scarce. Hence a single focus is required and fragmentation should be avoided at all costs.

Unfortunately one can already identify three main players who are involved in climate change policy, these being:

- MEPA (falling under the Office of the Prime Minister) and which has been responsible for preparing Malta's Communications to the UNFCCC;
- The University of Malta, which has acted as the Project Manager and drafter of these Communications; and
- The Ministry for Resources and Rural Affairs.

Of course Malta cannot afford to fragment its pool of resources and therefore moves towards consolidation should be pursued. However, one also has to bear in mind the amount of data that is usually necessary for climate change scenarios to be formulated. This data may be in the hands of a number of different stakeholders thereby limiting the comprehensiveness of a singular pool of data. Consequently one could propose that recommendations 6, 12 and 16 might need to be revisited in order to create a singular entity that brings together a platform of data which shall be populated in a mandatory manner by identified entities.

This would enable the created entity not only to have access to the full data set but also to be empowered with the development of a national work plan. Inter ministerial committees do not always work and therefore the validity of Recommendation 15 is questionable possibly in favour of an entity with a legal mandate empowered to make available the datasets required for its operation.

Climate Migration

Perhaps one topic which has not been covered in this draft document is the potential of climate migration effects on the Maltese Islands as a result of global and local climate change patterns. Political, economic and social migration is a reality and can be easily mapped. If people can travel from country to country and from continent to continent for these reasons there is no reason that this can happen for climatic reasons. The second communication to the UNFCCC will be dealing with this aspect and this strategy should also consider devoting some space to this topic.

Adaptation and Mitigation

Although it is true that adaptation measures are being tackled through the Second Communication to the UNFCCC, it is equally important to ensure that a holistic strategy is oriented to take into account both these aspects. It is only through the amalgamation of adaptation and mitigation measures that a national action formula can be realistically arrived at.

Adaptation is aimed at changing behaviours and involves human adaptation to prevailing conditions. On the other hand mitigation is more interventionist with today's mitigation measures generating the need for future mitigation measures. The focus is increasingly shifting towards adaptation measures through which the population can respond in the most natural manner to the ongoing changes. Mitigation often involves significantly higher expenditures which, after a period of time, may be zeroed as climate change trends continue to prevail and exceed anticipated limits.

Climate change adaptation is about ensuring that human beings and ecosystems survive and continue to develop despite prevailing extremes in weather events. A lack of adaptation measures to live in harmony with these external circumstances will result in impacts being of a far higher magnitude with consequential instability.

Consequently due consideration should be made to harmonise the contents of this document as well as that being prepared as Malta's Second Communication to the UNFCCC such that one integrated strategy for the Maltese Islands is embraced covering both adaptation and mitigation measures whilst at the same times identifying our island's vulnerability to the onset of the climate change phenomenon.