STATES OF JERSEY

THE BENEFITS AND DISADVANTAGES OF ADOPTING CENTRAL EUROPEAN TIME IN JERSEY

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STATES GREFFE

CONTENTS

EXECUTIVE SUMMARY

The purpose of this report is to help inform public debate on the prospect of Jersey adopting Central European Time (CET).

The key questions to consider are –

1. **Would the benefits outweigh the disadvantages of moving an hour of daylight from the morning to the evening and entering into synchronicity with Central Europe?**

   and,

2. **Would the benefits of such a change outweigh the disadvantages of moving out of synchronicity with the United Kingdom, Ireland and Portugal?**

A summary table of anticipated benefits and disadvantages is provided below along with the corresponding page numbers in the text.

Consideration	Benefits	Disadvantages	Page Number
Quality of Life	Moving an hour of daylight from the morning to the evening will allow people to spend more leisure time outdoors; particularly in the summer (Latest sunset would be 22.18 on 21st June.)	Negative impact of lower amount of daylight in the winter mornings. (Latest sunrise in Jersey would be 09.04 on 3rd January).	8
Road Safety	A traditional argument has been that less daylight in the morning would increase accidents. However, several in depth studies have demonstrated that overall accident levels would reduce. The Royal Society for the Prevention of Accidents supports a move to CET for the UK. The Department for transport estimates a net reduction of between 104 and 138 fatalities on UK roads. However, it is difficult to infer any similarities with the situation on Jersey roads without further analysis.	Despite the offset of less accidents in the evening, there may still be increased accidents in the darker mornings. Further analysis would be required to determine the effects on road safety in Jersey.	8
Health	Potential benefits to public health from increasing exercise levels due to longer evenings. Some studies on Depression	Most negative health effects from changing time zones appear to be related to the impact of actually changing the arrangement. This would be mitigated by an autumn	

	conclude that later sunrises can actually have a positive effect on the mental health of a population.	change to CET (not putting the clocks back and then putting them forward as normal the following spring). Reduced morning light levels may have a negative effect on sufferers of Seasonally Affected Depression (SAD). The situation would need to be carefully monitored.	10
Energy	There have been no major studies on this for areas with a similar energy profile and latitude to Jersey, However, a common argument is that energy would be saved as a result of increased daylight in the evening and spreading peak demand over a longer period.	The counter-argument is that more energy would be expended by people leaving lights and appliances switched on when they leave a dark house in the winter. A major study by the University of California has concluded that a move to daylight saving time in Illinois would result in a cost to the economy of increase in energy use due to higher air-conditioning costs on hot afternoons and increased heating costs on cool mornings.	11
Travel and Freight	Harbour and Airport schedules would stay at the same time Western European Time (WET) so flights and ferry departures from the Island would leave later in the Jersey working day (later start for morning flights to the UK). Aviation noise would be noticed later in the morning.	Flights and scheduled maritime traffic to the Island would arrive one hour later in the Jersey working day – possibly resulting in later supply of goods. Timetables would have to be changed and republished. Aviation noise would continue later into the evening.	12
Communications	Communications with countries to the east would benefit from increased overlap of the working days.	Communications with the United Kingdoms and countries to the west would be disadvantaged by less overlap of the working days.	13
Television and Radio		Television programmes would be an hour later in the Jersey working day (News at 10 would be at 11:00 p.m. Jersey time). The spread of new technologies such as Internet television on demand and playback	13

		machines such as Sky+ and Virgin+ could reduce this problem over time.	
Finance Industry	Business that trade mainly 'to the east' would benefit from closer synchronicity to European and Asian markets.	Businesses that trade to the West or primarily through London (most of the Island's business) would have to alter certain working hours.	16
Tourism	Benefits of portraying Jersey as a more 'continental' destination.	Some disruption due to timetable changes (slots would remain at the same time in WET so they would be one hour later in the Jersey working day).	16
Agriculture	Increased amount of daylight in the evening would benefit producers who carry out work during this time.	A decreased amount of daylight in the morning would lengthen the amount of time producers would need to work in darkness in order to meet the market opening times.	16
Leisure	Businesses would benefit from an increased number of people participating in leisure activities during the evening daylight hours.		17
Other Industries	Businesses that have later trading hours would benefit.	Businesses that rely on early daylight would be adversely affected, such as construction, postal deliveries.	17

If the States of Jersey were to decide to adopt Central European Time then it is clear from some of the uncertainties outlined in this report that it should be adopted on an experimental basis with continual monitoring of its effects across all areas of the Island's society and industries.

Section 1 – Introduction

This report highlights a number of areas that will be most strongly affected by a change in Jersey's timekeeping arrangement to Central European Time (CET). It is not the intention to provide a comprehensive analysis of total effects in each area, but rather to inform public debate on this important issue by suggesting the areas in which the effects would most strongly be felt.

The clocks in Jersey are currently set to Greenwich Mean Time (GMT) in the winter and are moved on by one hour to British Summer Time (BST) in the summer (GMT+1) this places us in the Western European Time Zone (WET).

The Central European Time Zone (CET) is one hour ahead of WET all year round.

The choice over whether or not to change to Central European Time is relatively simple – we either change or we don't. A decision to go ahead would also be relatively easy to implement – we could simply decide not to put our clocks back one autumn and then put them forward as normal the following spring.

Joining the Central European Time Zone would provide one extra hour of daylight in the evening throughout the year and mornings would be darker for one extra hour.

However, despite this apparent simplicity, a change to any society's timekeeping arrangements is a matter that demands full and careful consideration. The effects of the change, for better or worse, would be highly pervasive throughout all areas of Island life and in some of these areas the effects are difficult to predict.

In addition to the effects of a change to our local time profile, under Central European Time we would enter the same time zone as most of Western Europe but no longer be in the same time zone as the United Kingdom, Portugal, Ireland and Iceland.[1]

A key issue to consider is clearly that in changing to Central European Time the Island would no longer be in synchronicity with the United Kingdom. Accordingly, it is crucial to consider not only –

1. would the benefits outweigh the disadvantages of moving an hour of daylight from the morning to the evening and entering into synchronicity with Central Europe?

but also:

2. would the benefits of such a change outweigh the disadvantages of moving out of synchronicity with the United Kingdom, Ireland and Portugal?

In order to highlight the issues involved in trying to answer these questions, this report analyses some of the possible changes to quality of life, road safety, health, energy use, travel, communication, entertainment and the effect on Jersey's main industries.

A principle source of evidence used in this analysis is the reported responses to a public consultation on Central European Time, conducted in 1993 by the then Policy and Resources Committee (summarised in Appendix B) The consultation was thorough and informative but there are some aspects of Island life that have changed since then (due to new technologies and changes to working practices) and in some areas new information is available that affects our understanding of an issue.

It is hoped that all Jersey residents will find this report to be a useful springboard to further discussion around these issues.

Section 2 – Analysis by Topic

Quality of Life

Perhaps the single most compelling argument for adopting Central European Time in Jersey is on grounds of quality of life for Islanders. The amount of daylight available to people has long been considered a factor in quality of life. The health implications of this are discussed below. The act of effectively moving an hour of daylight from the morning to the evening could have a very positive impact on the amount of daylight available to people during the times at which they could enjoy it. For instance, anybody involved in outdoor evening activities would not only enjoy an hour extra daylight in the evenings, their 'season' would effectively be longer as, weather considerations aside, more evenings of the year would be light after normal working hours. The latest sunset would be at 10:18 p.m. and the sun would set after 7:00 p.m. for 233 days (as opposed to 184 days und the current arrangements).[2] The sun would also set later than *the year's latest sunset under the current arrangements* for 115 days.

Consideration must be given to those who would be adversely affected by the decreasing amount of daylight in the morning. It should be noted that under Central European Time the latest sunrise would be at 9:04 a.m. and the sun would rise after 8:00 a.m. for 149 days of the year. The sun would rise later than *the year's latest sunrise under the current arrangements* for 141 days. The full details of times for sunrise and sunset can be found in Appendix C.

A further consideration could be the effects on aviation noise. Flight schedules would remain the same time relative to Greenwich Mean Time (GMT), and thus become an hour later in the Jersey day (see page 13). There could be a consequent adverse social effect of aircraft noise lasting longer into the evening. This would obviously have the strongest effect on people who live in a flight path or near the Airport. By the same measure, there would presumably be a reduction in the amount of aviation noise in the mornings.

On the whole, a change to Central European Time would have a positive impact on the quality of life for Islanders who spend time outdoors in the evening but a negative impact on anyone who values morning daylight more highly than evening daylight.

Road Safety

When considering changes to any time zone, the effects on road safety must be of primary concern. During past discussions on Central European Time in the UK, road safety has often been cited as a reason not to proceed[3]. Indeed, in Jersey, 89% of respondents providing views on accidents in the 1993 consultation were concerned that darker mornings would lead to an increase in the number of accidents. However, extensive research carried out by the UK Department of Transport predicts that between 104 and 138 lives would actually be saved on UK roads by the UK adopting Central European Time.[4] In this instance the evidence starkly contradicts the conventional thinking. It would appear that any increase in accidents in the morning would be greatly offset by a reduction in accidents in the evening. This is the case with children as well as adults as the majority of accidents involving children take place in the evening and not the morning. The evidence presented by the Department of Transport is compelling enough to have received the backing of the Royal Society for the Prevention of Accidents.[5]

It is should also be noted objections concerning the safety of schoolchildren during the 1968 – 1972 experiment with British Standard Time were mainly from west Scotland, where the latest sunrise was after 10:00 a.m.[6]. It is worth noting that this is an area of the British Isles that is furthest removed from Jersey's own daylight profile.

No such study has been carried out in Jersey and it is difficult to draw any conclusions from Jersey Road Traffic Collision (RTC) data either for or against the concept. Given the level of RTCs we experience, due consideration must be given to variables such as:

- weather conditions
- seasonal variations in traffic loads on the roads
- impact of school holidays on traffic loads on the roads.

This is particularly important given that the time changes would impact on light conditions during peak periods of traffic flow when RTCs are highest anyway.

It is also questionable whether we should refer to all RTCs. Do light conditions have any influence, for example, on the speeding drink-driver or a shunt in a queue of traffic in a well-lit town street? A significant study would be needed to address these questions. The UK study may be informative to the situation in Jersey but there are confounding factors in the UK such as speed, more severe weather conditions and significant differences in the number of daylight hours as you head north). The UK report itself warns against simplistic use of Police data –

> "If light levels and the timing of sunrise and sunset do affect the incidence of road casualties, then presumably this should be apparent from the mass of police accident records collected over recent years. It is tempting to think that a suitably refined analysis of this massive database would be able to quantify accurately the effects, leading to a trustworthy prediction of the effect of any proposed modification of the system of timekeeping. But such data inevitably encompass a range of statistical variations arising from known and unknown factors, and do not of themselves provide an immediate answer. The process of inference must be a statistical one. A realistic expectation is that an analysis which recognizes the major sources of uncertainty will provide the basis for informed assessment."

In short, putting together a reliable analysis, will take time and resources. This view is supported by the Road Safety Officer who says –

> "As discussed my view is that our figures are so small we couldn't draw any real conclusions from our own figures. Certainly RoSPA have done research based on UK figures and have concluded that should they follow European time within the UK it would save lives and are keen to see the change happen. Should a change be proposed locally I don't think we have meaningful local evidence to push this through on a road safety basis."

It may be worth pointing out that none of the 17 fatal road traffic collisions in Jersey over the past 8 years have occurred at times of day or in circumstances where the prevalent light conditions due to the application of GMT, BST or CET would have made any difference.

On balance it would appear that whilst it is difficult to draw conclusions from the data available in Jersey, the evidence is certainly not as decisively against a move as opinion in 1993 indicated. This is clearly an issue that demands further reflection.

Health

From a public health perspective, any overall increase in outdoor exercise resulting from an extra hour of evening daylight would represent a positive development both in terms of general wellbeing and in helping to combat obesity. (One of Jersey's greatest public health challenges.)[7]

Advocates of adopting Central European Time in the UK maintain that more time spent in the sunlight would reduce Vitamin D deficiencies, especially in children and elderly people[8], and help people with depression and seasonal affective disorder (SAD) – a specific type of depression believed to be related to reduced exposure to sunlight[9]. UK studies are limited but low Vitamin D levels are a problem for 6-18% of the elderly US population.[10] Most correspondents expressing a view on issues for the elderly in the 1993 consultation were of the view that longer hours of sunlight in the evenings would be beneficial as this is a group that is disproportionately affected by safety fears in the dark.

If Jersey adopted Central European Time, the increased amount of evening daylight would appear to be good news for SAD sufferers (the latest sunset would be at 10:18 p.m. and the sun would set after 7:00 p.m. fo 233 days), but this must be weighed against any detrimental effects from later sunrises and a reduced amount of daylight in the morning. Such effects would be most prominently felt in the winter months (the latest sunrise under CET would be 9:04 a.m. and for 149 days the sun would rise later than 8:00 a.m.) However, some studi

suggest that a later time of sunrise can actually lower the prevalence of depression in a general population[11]. Other seasonal factors such as temperature and weather would, of course, be unaffected by the change.

Many of the negative effects on health result from the act of changing a time zone rather than from the actual arrangement of a time that the population has had time to adapt to. Circadian rhythms (biological clocks), play a role in regulating behavioural and physiological processes and are synchronised by the daily cycle of day and night. The spring change (when we 'lose' an hour) is thought to upset this cycle in healthy adults who get less than 8 hours' sleep or are more active in the evenings and particularly difficult for anyone with depression or whose circadian rhythm is disrupted by a delay in the secretion of melatonin, the hormone responsible for inducing sleep.[12],[13] However, these concerns are related to the *specific time at which the clocks are changed*. If the States of Jersey decided to implement Central European Time by the preferred method of *not* putting the clocks back in October and then putting them forward as normal the following spring, the effect of change would not only be minimised but actually averted on the one occasion in October when the clock would not be changed as normal.

Overall, the public health benefits of adopting Central European Time, particularly with respect to any benefits from increased exercise levels due to lighter evenings, could be far-reaching but the effects on people vulnerable to seasonal depression should be carefully monitored if Central European Time were to proceed.

Energy

Increased oil costs may mean that any savings in energy use that result from introducing CET would be greater now than they would have been in 1993. Energy demand in the evening would also be more spread out than is currently the case. This could mitigate the pressures of peak demand and potentially lead to lower costs from European energy providers. Furthermore, if people were spending a greater portion of their evening outdoors then evening energy use could be expected to decrease. However, such reasoning is theoretical. No comprehensive studies have been carried out in Jersey or the UK into the effects of adopting Central European Time on energy demand. It was suggested in a recent House of Lords debate that any potential savings for the UK in the use of energy in the evening would be wiped out by people leaving their lights on as they leave their houses in the dark mornings and by the increased reliance of the construction and maintenance industries on floodlighting[14]. Furthermore, it is possible that an increase in the Island's reliance on energy from the European grid since 1993 could mean that synchronising more closely with the times of peak demand in Central Europe could place greater demand on the European grid at peak times and lead to higher costs.

With respect to more general assumptions about the energy implications of changes to time zones, there have been a number of recent detailed studies in the United States. The California Energy Commission published a report in 2007 which demonstrated that there was no clear evidence that electricity would be saved from the earlier start to daylight saving time and that there was a chance that there could be a very small increase in electricity consumption.[15]

Later research from the University of California showed that having the entire state of Indiana switch to daylight saving time would cost households about $8.6 million in electricity bills each year.[16] The study also estimated social costs of increased pollution emissions that ranged from $1.6 to $5.3 million per year. Moreover, the reduced cost of lighting in afternoons during daylight-saving time was offset by higher air-conditioning costs on hot afternoons and increased heating costs on cool mornings. It should be stressed that these reports relate to areas with a different latitude and energy profile to Jersey so the appropriateness of their findings to the Island should be considered with caution. They may nevertheless be of use in beginning to inform debate on some of the issues that Jersey may face.

It is clear that the implications on energy use are difficult to ascertain without the existence of a full report. This is something the UK might consider conducting if they choose to further investigate the case for CET but it would prove costly for Jersey to conduct this level of research independently. If an experimental trial of Central European Time occurs in Jersey then the effects on energy use should be carefully monitored and reported upon before considering whether to confirm the move.

Travel and Freight

Due to the complex arrangement of the timetable for airline slots and the immutable nature of the tides, the schedules for both the Airport and the Harbours would stay at the same time in WET. This means that flights from the Island would leave later in the Jersey working day. A flight from Jersey to Gatwick which left at 8:00 a.m local time (CET) would typically arrive at 8:00 a.m. UK time (WET). By the same token, a flight that left Gatwick at 8:00 a.m. UK time would typically arrive in Jersey at 10:00 a.m. local time. This would, presumably be to the benefit of most people flying from Jersey to the UK but to the detriment of anyone flying from the UK to Jersey, particularly for anyone flying for business purposes. This is, of course, similar to the current disparity in travel to and from France, which would cease to exist if Jersey adopted Central European Time.

Travel companies and the service providers could incur some costs if timetables had to be changed and republished to reflect the time in Central European Time instead of in WET.

It is also of some concern that commercial flights and shipping to the Island would arrive one hour later in the Jersey working day. It is possible that this could result in a later supply of goods to Island businesses. The mail and newspaper planes currently arrive at when the Airport opens at 5:30 WET. It has been suggested that these flights could be rearranged to allow their arrival at 5:30 CET. In reality, this is unlikely as it would lead to an increase in the length of the Airport opening hours (the Airport would still open at 5:30 a.m. but would close an hour later as all other flights would be an hour later in the Jersey day). This would lead to an increase in operating costs, which would be exacerbated if shift work were required. In addition, it may not be possible to arrange for the mail and newspaper planes to leave an hour earlier as the departure time is dependent on UK distribution timetables. The most likely scenario is that newspapers and mail would arrive one hour later in the Jersey working day, along with all other flights.

These difficulties are not insurmountable but the management of such changes would require careful consideration if the decision was taken to adopt Central European Time.

Communications

Under Central European Time the Jersey working day would start and end an hour earlier relative to the current arrangements. Consequently, telecommunications with countries to the east of our current time zone (WET) would benefit from increased overlap of the working days. This would include all countries currently in Central European Time as well as Eastern Europe, the whole of Asia and Oceania.

Conversely, telecommunications with any countries currently in the WET time zone and countries to the west of it would be disadvantaged by a reduced overlap in the working days. This would include the UK, Ireland, Iceland, Portugal and the whole of North and South America.[17]

Due to the Island's extensive links with the United Kingdom, a reduction in the available contact hours would appear to be undesirable. However, such problems may be mitigated by the use of e-mails and/or flexible working hours – a notion that is explored below in the section on Finance.

Television and Radio

Perhaps the area in which a change to Central European Time would be most immediately felt is entertainment. With respect to radio and television, Jersey residents almost exclusively tune in to channels from the UK (apart from local broadcasts). Under Central European Time all programmes would be an hour later in the Jersey working day ('News at 10' would be at 11:00 p.m. Jersey time). While the effects of this can only be described as an inconvenience, they would be highly pervasive. To some individuals the change may be strongly irritating, but the main inconvenience would only be felt in the first few months of adapting to the change. It has been suggested that automatic recording systems on DVD and VCR recorders would be adversely affected as they use Teletext as a reference for WET. This may be an issue for some people but could be mitigated by continuing to operate the machines in WET and manually taking into account an extra hour for the local viewing time. Furthermore, the

spread of new technologies such as Internet television on demand and playback machines such as Sky+ and Virgin+ could reduce this problem over time; future technologies and 24 hour news coverage may well obviate the problem entirely. Of course, the individual effects of such a change are a matter of personal preference. However, it is of some concern that this would probably be of little help to sections of society that would have the most difficulties adapting to the change, such as the very elderly.

Operational impact on States Services

Responses received from Chief Officers of the States of Jersey indicate that there will be very few areas that will be adversely affected by a move to Central European Time. In some areas, such as fisheries patrol (greater synchronicity with French operating hours) and transport of patients to the UK (patients could, in theory, catch a flight later in the Jersey day to arrive in London for a 9:00 a.m. appointment), a positive effect would be felt.

The response from Education, Sport and Culture presents an interesting case. In the 1993 consultation 70% of the educational establishments that submitted responses were against the introduction of Central European Time (most of whom cited concerns about the safety of school-children in the mornings). This position appears to have changed somewhat in the light of the Royal Society for the Prevention of Accidents' support for adopting Central European Time in the UK.

In February 2008, the Department for Education, Sport and Culture (ESC) made the following points regarding the adoption of Central European Time in Jersey and its affect on the business of the Department –

> *"The implication of introducing CET on the operation of the Department was seen as neutral with no benefits or negative consequences identified. Although phoning associates in the UK is widespread across the Department, the one hour time difference was not viewed significant enough to cause problems. However, one Head Teacher noted that the hour differential could pose an extra problem when planning trips to the UK.*
>
> *In terms of the delivery of different ESC services, the adoption of CET and the resulting lighter evenings were seen as creating opportunities and increasing participation levels in activities. For example, lighter evenings may have a positive benefit on the numbers attending Youth Clubs and participation in outdoor sports activities.*
>
> *Although the RoSPA study indicated that darker mornings would reduce accidents and save lives, this was questioned by some who were consulted. It was felt that darker mornings would potentially cause problems for children getting to school. One Primary Head Teacher noted that darker mornings would result in it being 'dingy' in the playground first thing, but did not think this would be too much of a problem.*
>
> *The benefits of a move to CET for schools would result in 'after school clubs' extending outdoor activities past 4pm during the darker months and staff leaving work in the daylight.*
>
> *There may be implications with regard to the sitting of exams. As Jersey's curriculum follows the UK, exams must be sat at the same time. In practice, this may mean simply starting exams at 10am and 3pm instead of 9am and 2pm.*
>
> *Therefore, to conclude, a move to CET within Jersey is viewed by ESC as having a number of benefits to the operation of the business; including increasing participation levels in activities within schools, lifelong learning and sport and leisure and providing lighter evenings for pupils and students and staff to return home in the daylight.*
>
> *However, negative consequences from the adoption of CET were also identified which included administrative problems when planning trips to the UK and the potential problems caused by the darker mornings to ensure children arrive safely at school."*

The operation of the harbours and the Airport is an area that could have potential difficulties with a move to CET.

This area has already been discussed above under the heading of ‘travel’ but, with respect to States services there could also be implications for the arrangement of shift patterns for Customs and Immigration.

The situation in similar jurisdictions

1. The Bailiwick of Guernsey (Guernsey, Sark, Herm and Alderney)

Due to our geographic and cultural proximity to the other Channel Islands it is reasonable that if it were in the interests of one to change time zones, it would also be in the interests of the others. On Wednesday 27th February 2008 the States of Guernsey debated a Requête to introduce Central European Time (the proposition was introduced by the then Health Minister, Deputy Roffey). This proposition was ‘referred back’ for further research. The Chief Minister’s Department in Jersey will continue to liaise with its Guernsey counterparts with a view to sharing research and developing a common implementation plan in the event of both jurisdictions wishing to implement CET.

2. The Isle of Man

The Isle of Man is significantly further north and west than the Channel Islands. They currently have no plans to change time zones and it is very unlikely to be in their interests to move to Central European Time unless the United Kingdom and/or Ireland also do so.

3. Gibraltar

Gibraltar presents an interesting case with respect to Central European Time. Prior to 1982 the territory used GMT+1 all year round. This synchronised Gibraltar with Britain during the summer and with Spain during the winter. When the border with Spain was opened in 1982 Gibraltar adopted Central European Time and became in synchronicity with Spain year round. As a result of the change they benefited from being in full synchronicity with at least one of their two most important partners. Gibraltar also reported greater awareness from other jurisdictions as to its expected trading hours. There are some important lessons that Jersey could learn from this experience but it should be noted that Jersey’s daylight profile is markedly different; we would be leaving full synchronicity with the United Kingdom and entering full synchronicity with Central Europe.

Section 3 – Predicted Impact on Industry

Finance Industry

Due to the global nature of Jersey's finance industry, any shift in the Island's timekeeping would be expected to have an impact on the industry. For any firm, the altering of time 'windows' available for contacting business associates elsewhere in the world would be a consideration. A key issue here is the level of business conducted with the United Kingdom. A move to Central European Time would obviously reduce the contact hours available during normal Jersey working hours for contact with the UK, as well as Portugal, Ireland and the Americas. By the same token, overlap of normal working hours would improve with respect to the rest of Central and Eastern Europe and all other countries to the east. Unfortunately, no data is available for the proportion of trade Jersey has with other countries. However, it is widely assumed that the majority of Jersey's overseas financial dealings remain with the City of London.

In the 1993 Consultation, a conclusive majority of respondents from the finance industry (84%) were against introducing Central European Time independently of the United Kingdom. This figure is stark but it should be remembered that circumstances may have changed. Many of the objections in 1993 were due to problems of communications such as having a reduced overlap of working hours in which to telephone associates. However, a number of business practices have changed since 1993 which could suggest that financial firms would have less difficulty adapting now than they would have done then. E-mail has replaced the great majority of telephone communication and can be sent at any time in order to be read at the recipient's earliest convenience, and increased flexibility of working hours could substantially offset any problems.

Tourism Industry

This is traditionally a sector that has provided strong support to the prospect of adopting Central European Time in the Island. In the 1993 consultation, 73% of correspondents from the Tourism Industry were in favour of adopting Central European Time locally. There is nothing to suggest any change in opinion or circumstance since then. The increased amount of daylight in the evenings could make Jersey a more attractive destination to tourists and the marketing opportunities at the time of change could be significant. Any increase to visitor numbers might help to offset any potential increase in operational costs of the Airport and harbours.

Agriculture

For many in the agriculture industries, an even earlier start would not be unduly detrimental (most dairy farmers start their day in the dark already). At certain times of the year, a decreased amount of daylight in the morning could lengthen the amount of time producers would need to work in darkness in order to meet the market opening times, although this may be offset by increased amount of daylight in the evening which would benefit producers who carry out work during this time.

With respect to the dairy industry, an argument has been expressed that cows may become 'confused' by a differing time zone.[18] This is perhaps not as bizarre a prospect as it might sound, a number of studies[19],[20], demonstrate that the production of milk is affected by changes in circadian rhythms in cows.

However, most of the suggested adverse effects on cattle are a result of the change to a cow's routine and not of the relative timing of the routine. As would be the case with people, in the event of adopting Central European Time by the preferred method of not putting the clocks back in October and then putting them forward as normal the following spring, the effect of change on cattle would not only be minimised but actually averted on the one occasion in October when the clock would not be changed as normal.

Leisure

If more people were spending time outdoors in the evening then the leisure industry would benefit. The industries would also benefit from any increase in visitor numbers and would be unlikely to be adversely affected by the later sunrises in the morning. In 1993, all respondents commenting on leisure perceived a benefit in adopting CET

and there is no reason to suggest that this position would have changed since then.

Other Industries

Many office-based service companies could be expected to have the same considerations as the finance industry. Jersey's night time economy could benefit from longer hours of daylight in the summer. The construction industry might be at a slight disadvantage. Many construction firms currently benefit from an early start, which helps avoid rush-hour traffic when delivering materials. To continue to avoid the rush hour the construction time would have to start during the hours of darkness for some of the winter. This could be made possible by the use of floodlights. Such practice would obviously increase the operating costs. However, more hours of daylight would be available in the winter during which work could take place. This extra potential for productivity could help to offset the increased costs in the morning.

Section 4 – Conclusion

A change to Central European Time is a relatively simple change to implement. It has the potential to improve the overall quality of life in the Island at very little cost to the States of Jersey. As such, it might be considered a, 'quick win' in policy terms. However, it would not be wise to underestimate the pervasive nature of this change. On the face of the issues discussed in this report the benefits could be significant. In many areas, such as quality of life, health, road safety and the effect on the tourism industry, a change to Central European Time could bring considerable benefits to the Island. In some areas, such as travel and entertainment, there could be some significant disadvantages. In other areas, such as energy use, communications and the effect on the finance industry, the consequences are neutral or difficult to quantify without further extensive analysis. It is hoped that this report will encourage debate and provoke consultation responses on this last group in particular.

If the States of Jersey were to decide to adopt Central European Time then it is clear from some of the uncertainties outlined in this report that it should be adopted on an experimental basis with continual monitoring of its effects across all areas of the Island's society and industries.

APPENDIX A

Glossary and Explanatory Note

Throughout this paper, phrases like “moving an hour of daylight from the morning to the evening” and “increasing the amount of daylight in the evenings” have been used to describe the felt effect of moving Jersey’s time zone to Central European Time. These terms have been used to help explain a phenomenon that our vocabulary is not particularly equipped to deal with.

The following way of thinking about the change may be helpful for further clarity:

It goes without saying that the Sun will continue to rise and set according to its relative position with the Earth; the absolute time would not alter. If Jersey adopted Central European Time then we would put our clocks forward one hour. This will have the effect of rearranging the Jersey working day to start one hour earlier in absolute time. If the sun rises at 8:00 a.m. under the current arrangements (Western European Time (WET)) then under Central European Time (CET) we would call this 9:00 a.m. Similarly, if the sun set at 7:00 p.m. WET then we would call this 8:00 p.m. under CET. Daylight Saving Time would take place as normal.

In this report the abbreviation WET has been used to refer to the Western European Time Zone, which is composed of Greenwich Mean Time (GMT) in the winter and British Summer Time (GMT+1) in the summer. Similarly, the abbreviation CET has been used to refer to the Central European Time Zone which is composed of Central European Time (GMT+1) in the winter and Central European Summer Time (GMT+2) in the summer.

The field of time-keeping arrangements is full of other terms that can lead to confusion. In the interest of simplicity such terms have been kept to a minimum but are outlined overleaf for reference.

Time-keeping arrangements

Full name	*Abbreviation*	*Description*	*Summertime*	*Wintertime*
Central European Time Zone	CET	The time zone currently used by most of Western Europe.	GMT+2	GMT+1
Western European Time Zone	WET	The time zone currently used by the United Kingdom, the Crown Dependencies, Iceland, Ireland and Portugal (it is composed of GMT in the winter and BST in the summer).	GMT+1	GMT
Greenwich Mean Time	GMT	The time from which British timekeeping arrangements are referenced. It is derived from the fixation of noon at the average time of the sun's highest point at the Greenwich Meridian in East London.	–	GMT
British Summer Time	BST	The daylight saving time currently used in WET	GMT+1	–
Single/ Double Summer Time	SDST	Identical to CET but proposed in a recent House of Lords Bill to avoid references to Europe.	GMT+2	GMT+1
British Double Summer Time	BDST	The timekeeping arrangement used in the UK between 1940 and 1945 as a war time measure to increase productivity.	GMT+2	GMT
British Standard Time	BST*****	The timekeeping arrangement used between 1968 and 1972 in the United Kingdom and Crown Dependencies.	GMT+1	GMT+1
Universal Time	UTC	The time from which all other time zones are measured. Derived from the oscillation of Caesium atoms but functionally equivalent to GMT.	GMT (± 0.9seconds)	GMT (± 0.9 seconds)
Daylight Saving Time	DST	The generic term used for summertime arrangements around the world.	Normally, local winter time +1	–

*** not to be confused with British Summer Time**

APPENDIX B

Summary of 1993 Consultation (R.C.21/1993)

A full copy of this report is available from the States Bookshop

The States, on 29th September 1992, adopted a proposition to –

> "Charge the Policy and Resources Committee to investigate the possibility of Jersey joining the Central European Time zone and to report back to the States with recommendations as soon as possible."

The Policy and Resources Committee requested the Office of the Chief Advisor to undertake a comprehensive consultation on the subject. This survey was aimed at individuals, social groups and organisations and firms involved in various sectors of the economy. In consideration of the responses from the survey the Policy and Resources committee decided not to conduct a more detailed and technical investigation as it considered –

> "that this course of action would not be justified in terms of either the resources that would be need to be devoted to this task both from within and outside the States organisation, and/or the relevance of the data that would be obtained in the long run, given that it now appears that the United Kingdom Government will be actively reviewing its own situation with regard to Central European Time in the not too distant future."

The Policy and Resources Committee recommended that, "any local change to Central European Time should coincide with any such change being brought about by Her Majesty's Government for the United Kingdom".

The consultation document was sent to 216 organisations and individuals. Those canvassed included businesses, representative associations and individuals from all sectors of the Island's economy, those concerned with social provision, (for example, care for the elderly, schools, health and safety, etc.), and also those involved with all other aspects of Island life.

Those contacted were asked to provide their views on the potential introduction of CET, especially in so far as this might affect their own specific areas of interest, and more generally, in relation to the following common headings –

Accidents and crime
Energy
Communications
Travel
Agriculture, fisheries and food
Construction
Tourism
Leisure
The media

It was recognised from the outset that respondents would not necessarily have any knowledge of specialist research. The consultation recorded a response rate of approximately 60% from a wide cross-section of the sectors canvassed. The results were assessed globally as it was felt that there would be no worth in trying to quantify individual opinions.

Accidents and crime

With regard to accidents, the main disadvantage or concern (89% of those providing views), was the prospect of darker mornings, especially concerning an increased risk in children going to school. A minority considered that the risk in the mornings would be outweighed by a lesser risk in the lighter evenings. Some respondents felt that if the darker mornings were responsible for causing late starts, the morning rush hour would become worse.

With regard to crime, the agencies principally involved found it difficult to express a view in the absence of extensive research. As a general assumption, these agencies thought that there might be a slight decrease in vandalism and car thefts as a result of lighter evenings but there could be an increase in alcohol-related crime.

Some respondents commented that lighter evenings would benefit the elderly, as they are often fearful of walking in the dark.

Energy

The Jersey Electricity Company Limited considered that the proposal would be of benefit in terms of energy conservation. Lighting represents a higher proportion of electricity consumption in Jersey than in the UK and they considered that peak energy demand would be reduced by a reduction in the coincidence between lighting and heating and cooking demands.

Examining the global response, 30% saw a decrease in energy use, 40% an increase and 30% felt that there would be no significant difference.

Communications

The response clearly showed that the vast majority of the Island's business was with, or via the United Kingdom. This applied not only to the finance sector but also for many businesses in the retail, distributive and other sectors. Many respondents perceived a lack of synchronisation with parent companies, suppliers and markets to be a great disadvantage. It was noted that due to meal-times and breaks a good deal more than an hour's contact time could be lost. The general view was that, in a variety of organisations, the adoption of CET could lead to increased operational costs from adding an hour on to the working day or to an increase in overtime payments. Further possible disadvantages related to the fact that UK linked computer systems would be out of phase.

85% of respondents providing a view felt that there would be serious telecommunications disadvantages if Jersey adopted CET. Of those perceiving benefits (12.5%), it was noted that most of these respondents were involved operationally with Europe and/or the Far East.

The Postal Department pointed out that the arrival of mail in the morning was in no way affected by summertime, solely by the Airport opening times. However, any increased costs from a longer working delay would have to be passed on to the carrier.

Travel

There were various comments over the benefits and disadvantages of differing scenarios, but the majority of respondents felt that business travel would be adversely affected by Jersey adopting Central European Time in isolation. Airlines commented that United Kingdom slots would probably remain the same so there could be an extension to the working day (and operational costs) of the Airport and all dependent firms. The general view was that there would be a general confusion which would be disadvantageous not only to businesses themselves but also to the travelling public. The situation with shipping was seen to be very similar to the Airport due to tide restrictions.

Agriculture, fisheries and food

Dairymen, growers and marketing groups were, "almost unanimously," against any local change to CET. Dairymen felt that they would have to start earlier in the morning in any case and the darker mornings would increase their energy costs. Growers would have to start later than at present, with potential detriment to their UK trade. The larger retailers who responded offered the opinion that whilst there may be advantages to tourism, there were potentially considerable disadvantages to operating on a different time zone to the UK.

Construction

There was a feeling that darker mornings would necessitate the use of floodlights or a later working day. If the working day started later, the delivery times of materials would be far more in conflict with peak traffic times.

Tourism

A strong majority of respondents felt that introducing CET would be advantageous to the tourism industry. Reasons included: the 'continental feeling' and a uniqueness for Jersey, the increased daylight hours in the evening for staying on the beach, shopping, visiting attractions etc. There were also suggestions of a marketing opportunity with extended shoulder months becoming more attractive.

Leisure

All respondents commenting on leisure perceived a benefit in adopting CET.

The media

The vast majority of respondents on this heading felt that to be out of synchronisation with the United Kingdom would create confusion and difficulties generally. Concern was raised that local bookmakers would lose business, especially in the tourist season. Local media companies were concerned that there could be statutory problems in relation to adherence to codes and that there could be considerable disadvantages in terms of lost advertising revenue. Joint programmes with the UK and Guernsey would pose problems and cause scheduling difficulties.

Analysis of responses by Sector

Educational establishments – approximately 70% against the proposal

Emergency services – due to 24 hour operation, the introduction would not have any significant operational effect

States departments/parishes – 56% of respondents felt unable to give a view, 36% were opposed to local change, 8% were in favour

Finance Industry – 84% of respondents were against the proposal

Transport – 67% were against a move to CET (a majority would have favoured a change if it was tied in with the UK)

Agriculture – respondents unanimous in rejecting any change to Central European Time

Construction industry – respondents unanimous in rejecting any change to Central European Time

Tourism and leisure – 73% were in favour of a local change to CET

Chamber of Commerce Survey (separate from the States consultation) – of 225 respondents, 57% were in favour of a local form of CET and 42% were opposed

Other groups and associations – most, but not all, felt that, despite perceived advantages, it was not practicable for Jersey to adopt CET independently of the UK

The general public – 57% of respondents were against any local change

APPENDIX C

Comparison of the Sunrise/Sunset times between Current Time-keeping Arrangements (WET) and CET

Figures accurate for 2007 at Jersey Airport (49° 13'N 02°12'W)[21]

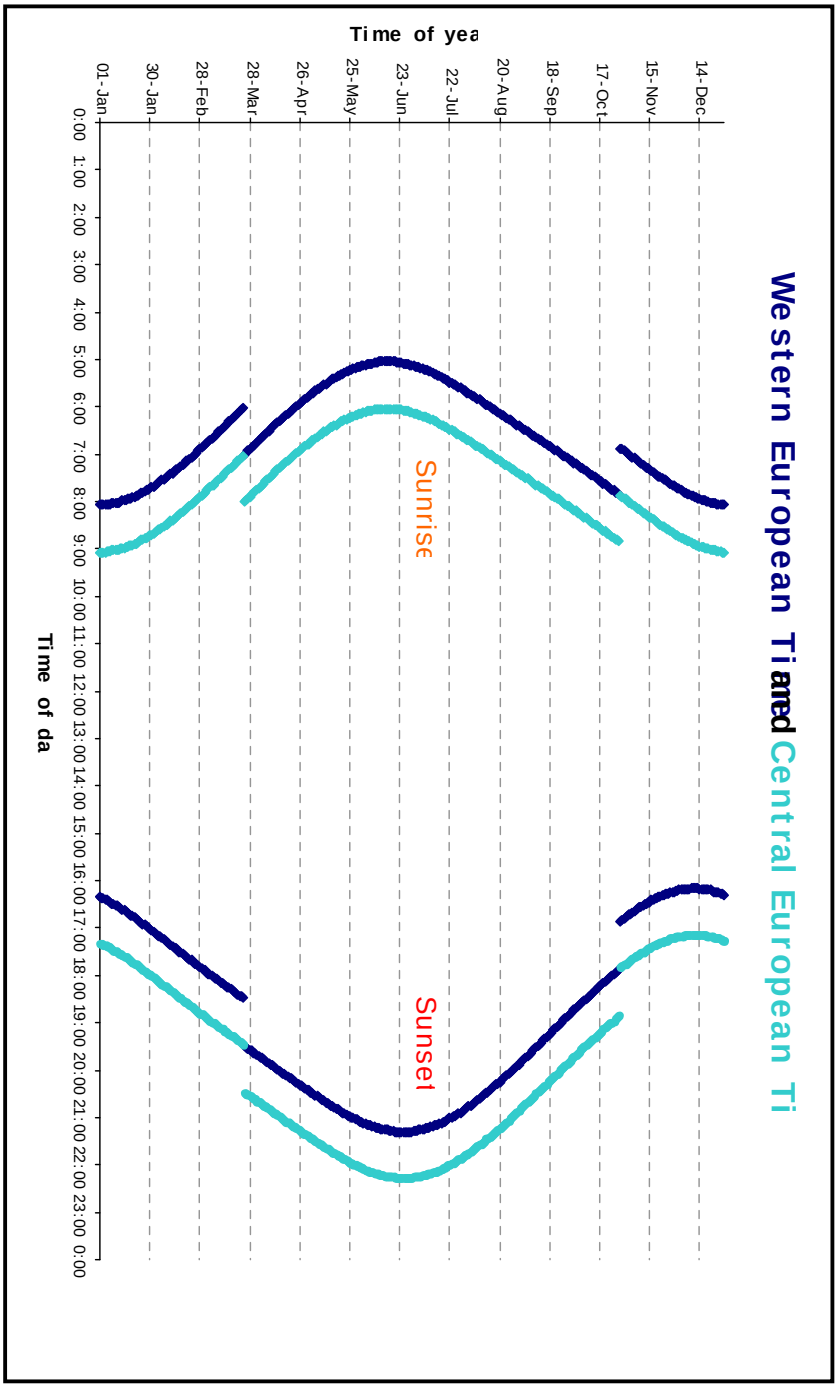

Table of Sunrise and Sunset for 2007 (49° 13' N 02° 12' W) **All times GMT**

	January		**February**		**March**		**April**		**May**		**June**		**July**		**August**		**September**		**October**		**November**		**December**		
Day	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Day
01	0804	1621	0741	1705	0652	1751	0547	1839	0448	1925	0409	2005	0407	2018	0440	1949	0524	1853	0608	1749	0656	1648	0742	1613	01
02	0804	1622	0739	1706	0650	1753	0545	1841	0447	1926	0408	2006	0408	2017	0442	1948	0526	1850	0609	1746	0657	1647	0743	1613	02
03	0804	1623	0738	1708	0648	1754	0543	1842	0445	1928	0407	2007	0409	2017	0443	1946	0527	1848	0611	1744	0659	1645	0744	1612	03
04	0804	1624	0736	1710	0646	1756	0541	1844	0443	1929	0407	2008	0409	2017	0444	1945	0529	1846	0612	1742	0701	1643	0746	1612	04
05	0803	1625	0735	1711	0644	1758	0539	1845	0442	1930	0406	2009	0410	2016	0446	1943	0530	1844	0614	1740	0702	1642	0747	1612	05
06	0803	1626	0733	1713	0642	1759	0537	1847	0440	1932	0406	2010	0411	2016	0447	1941	0531	1842	0615	1738	0704	1640	0748	1611	06
07	0803	1627	0732	1715	0640	1801	0535	1848	0438	1933	0405	2010	0412	2015	0449	1940	0533	1840	0617	1736	0705	1639	0749	1611	07
08	0802	1629	0730	1716	0639	1802	0533	1850	0437	1935	0405	2011	0413	2015	0450	1938	0534	1838	0618	1734	0707	1637	0750	1611	08
09	0802	1630	0729	1718	0636	1804	0531	1851	0435	1936	0404	2012	0413	2014	0451	1936	0536	1836	0620	1732	0709	1636	0751	1611	09
10	0802	1631	0727	1720	0634	1805	0528	1853	0434	1938	0404	2013	0414	2013	0453	1935	0537	1834	0621	1730	0710	1634	0752	1610	10
11	0801	1632	0725	1721	0632	1807	0526	1854	0432	1939	0404	2013	0415	2013	0454	1933	0539	1831	0623	1728	0712	1633	0753	1610	11
12	0801	1634	0724	1723	0630	1809	0524	1856	0431	1941	0403	2014	0416	2012	0456	1931	0540	1829	0624	1726	0714	1632	0754	1610	12
13	0800	1635	0722	1725	0628	1810	0522	1857	0429	1942	0403	2015	0417	2011	0457	1929	0542	1827	0626	1724	0715	1630	0755	1610	13
14	0759	1637	0720	1726	0625	1812	0520	1859	0428	1943	0403	2015	0418	2010	0458	1928	0543	1825	0627	1722	0717	1629	0756	1610	14
15	0759	1638	0719	1728	0623	1813	0518	1901	0426	1945	0403	2016	0419	2010	0500	1926	0544	1823	0629	1720	0718	1628	0757	1611	15
16	0758	1639	0717	1730	0621	1815	0516	1902	0425	1946	0403	2016	0420	2009	0501	1924	0546	1821	0630	1718	0720	1627	0758	1611	16
17	0757	1641	0715	1731	0619	1816	0514	1904	0424	1947	0403	2016	0421	2008	0503	1922	0547	1819	0632	1716	0721	1625	0758	1611	17
18	0756	1642	0713	1733	0617	1818	0512	1905	0423	1949	0403	2017	0423	2007	0504	1920	0549	1816	0634	1714	0723	1624	0759	1611	18
19	0756	1644	0711	1735	0615	1819	0510	1907	0421	1950	0403	2017	0424	2006	0506	1918	0550	1814	0635	1712	0725	1623	0800	1612	19
20	0755	1645	0709	1736	0613	1821	0508	1908	0420	1951	0403	2017	0425	2005	0507	1917	0552	1812	0637	1710	0726	1622	0800	1612	20
21	0754	1647	0708	1738	0611	1822	0507	1910	0419	1953	0403	2018	0426	2004	0508	1915	0553	1810	0638	1708	0728	1621	0801	1612	21
22	0753	1648	0706	1740	0608	1824	0505	1911	0418	1954	0404	2018	0427	2002	0510	1913	0555	1808	0640	1706	0729	1620	0801	1613	22
23	0752	1650	0704	1741	0606	1826	0503	1913	0417	1955	0404	2018	0429	2001	0511	1911	0556	1806	0641	1704	0731	1619	0802	1614	23
24	0751	1652	0702	1743	0604	1827	0501	1914	0416	1956	0404	2018	0430	2000	0513	1909	0557	1804	0643	1702	0732	1618	0802	1614	24
25	0749	1653	0700	1745	0602	1829	0459	1916	0415	1958	0404	2018	0431	1959	0514	1907	0559	1801	0645	1701	0733	1617	0803	1615	25
26	0748	1655	0658	1746	0600	1830	0457	1917	0414	1959	0405	2018	0432	1958	0516	1905	0600	1759	0646	1659	0735	1617	0803	1615	26
27	0747	1656	0656	1748	0558	1832	0455	1919	0413	2000	0405	2018	0434	1956	0517	1903	0602	1757	0648	1657	0736	1616	0803	1616	27
28	0746	1658	0654	1750	0556	1833	0454	1920	0412	2001	0406	2018	0435	1955	0519	1901	0603	1755	0649	1655	0738	1615	0804	1617	28
29	0745	1700			0554	1835	0452	1922	0411	2002	0406	2018	0436	1954	0520	1859	0605	1753	0651	1653	0739	1615	0804	1618	29
30	0743	1701			0551	1836	0450	1923	0410	2003	0407	2018	0438	1952	0521	1857	0606	1751	0653	1652	0740	1614	0804	1619	30
31	0742	1703			0549	1838			0409	2004			0439	1951	0523	1855			0654	1650			0804	1620	31

APPENDIX D

Time Zones of Europe

blue	Western European Time (UTC+0) Western European Summer Time (UTC+1)
red	Central European Time (UTC+1) Central European Summer Time (UTC+2)
yellow	Eastern European Time (UTC+2) Eastern European Summer Time (UTC+3)
green	Moscow Time (UTC+3) Moscow Summer Time (UTC+4)

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* The difference between Co-ordinated Universal Time (UTC) and Greenwich Mean Time (GMT) never exceeds 0.9 second; therefore for the purpose of this report the difference can be ignored.

Spain represents an interesting case. The country does use UTC+1, yet all life is typically organised 1 hour later than in the other UTC+1 countries.

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[1] A map of European Time Zones can be found at Appendix D.

[2] The time of sunset is defined as the instance where the last part of the solar disk is no longer visible on the horizon, (where the observer and the horizon are both at sea level). Twilight occurs for around 17 minutes after this time. The reciprocal relationship is also observed between sunrise and dawn.

[3] See Appendix B.

[4] Broughton, J. and Stone, M., "A New Assessment of the Likely Effects on Road Accidents of Adopting SDST" (Transport Research Laboratory, 1998) Available at: http://www.trl.co.uk/store/report_detail.asp?srid=2529&pid=108

[5] Leaflet on "Lighter Evenings", (Royal Society for the Prevention of Accidents) Available at: http://www.rospa.com/roadsafety/info/summertime_briefing.pdf

[6] Lord Tanlaw, "Lighter Evenings (Experiment) Bill [HL]" (House of Lords, 2006).

[7] Our Island, Our Health 2007; The Annual Report of the Medical Officer of Health 2007

[8] Unauthored, "World Health Organisation Factsheet on Vitamin D", (New York, 2004), available at http://whqlibdoc.who.int/publications/2004/9241546123_chap3.pdf

[9] Further details at www.sada.org.uk

[10] Thomas, M.K., et al., "Hypovitaminosis D in medical inpatients," New England Journal of Medicine 338 pp. 777-83 (Massachusetts, 1998)

[11] Olders, H., "Average sunrise time predicts depression prevalence," Journal of Psychosomatic Research 55 pp. 99-105, (Atlanta, 2003)

[12] Monk, T.H., Folkard, S., "Adjusting to the changes to and from Daylight Saving Time," Nature 261 pp. 688-9 (London,1976)

[13] Bunney, W.E., Bunney, B.G., "Molecular clock genes in man and lower animals: possible implications for circadian abnormalities in depression," Neuropsychopharmacology 22 pp. 335-45 (New York, 2000)

[14] *House of Lords Hansard 27th October 2006*

[15] Kandel, A. and Sheridan, M., "The Effect of Early Daylight Saving Time on California Electricity Consumption: A Statistical Analysis" (Los Angeles, 2007) Available at http://www.energy.ca.gov/2007publications/CEC-200-2007-004/CEC-200-2007-004.PDF

[16] Kotchen, M. and Grant, L. "Does Daylight Saving Time Save Energy? Evidence from a Natural Experiment in Indiana" (Santa Barbara, 2008) Available at http://www2.bren.ucsb.edu/~kotchen/links/DSTpaper.pdf

[17] See Appendix E for further details of European Time Zones.

[18] Letters in the Jersey Evening Post.

[19] Including: Evans, N.M., Hacker, R.R. and Hoover J., "Effect of Chronobiological Alteration of the Circadian Rhythm of and Prolactin and Somatotropin Release in the Dairy Cow", Journal of Dairy Science, Vol. 74 No. 6, pp. 1821-1829 (Ontario, 1991) and,

[20] Aranas T.J., Roussel1 J.D. and Seybt, S.H., "Circadian rhythm of aldosterone in dairy cattle during the summer" International Journal of Biometeorology Vol. 31, No. 3, pp. 237-247 (Oklahoma, 1987)

[21] Compiled by States of Jersey Statistics Unit from Jersey Met Office Data. (NB. Scale on Y axis is set to maintain ar equal number of days between gridlines.)
The time of sunset is defined as the instance where the last part of the solar disk is no longer visible on the horizon, (where the observer and the horizon are both at sea level). Twilight occurs for around 17 minutes after this time The reciprocal relationship is also observed between sunrise and dawn.