Water pricing in Malta[i]

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Brief summary of the case

Water pricing has traditionally been politically and socially sensitive in Malta. Household water consumption was effectively supported until the year 2000. Since then – following the issuing of a Maltese River Basin Management Plan in 2010[1] – a national scheme of water supply and water metering fees has been adopted to encourage more sustainable water use. This was later updated in the 2nd Water Catchment Management Plan, published in 2016. A 'rising block' tariff structure is used for water supply fees for domestic, residential and non-residential water use, although the highest non-residential water users benefit from a reduced tariff for the highest volumes. Self-abstraction of groundwater is a significant issue in Malta, in particular for agricultural use; this is frequently metered (in the case of boreholes), but not subject to water supply tariffs or extraction quotas. Water metering fees are also in place (with some exemptions).

Drivers for water pricing policy in Malta include high levels of water stress, compliance with EU legislation following accession to the EU, and an influential 2006 report by the UN Food and Agriculture Organization (FAO). The water supply and metering fees do not appear to have had a significant impact on the amount of water provided through the public water supply. In fact, total groundwater abstraction has increased over time, and self-abstraction from groundwater sources by the agricultural sector for irrigation purposes (for which no price is charged) doubled between 2004 and 2014.

Varying opinions on changes to Malta's water pricing policy have been found amongst political parties, citizens' movements and business, and there are indications that civil society and stakeholders are active with regards to water policy more generally. Future amendments to tariffs and the ongoing development of Maltese water policy will offer opportunities for further stakeholder engagement. Reforms could be considered to ensure that all water use (in particular self-abstraction for agricultural use) is priced in line with its environmental impacts.

1 Description of the design, scope and effectiveness of the instrument

1.1 Design of the instrument

Water pricing has traditionally been a politically and socially sensitive in Malta. The Maltese Water Supply Regulations[2] were initially adopted in March 1948, with the latest amendments made in 2015. Prior to Malta's accession to the EU, successive government policies effectively supported household water consumption by maintaining water tariffs at a stable level for

[1] Called the "1st Water Catchment Management Plan"; part of the Maltese implementation of the EU Water Framework Directive (2000/60/EC).

[2] http://downloads.rews.org.mt/files/f205b0aa-0d84-4a99-ad74-47703e00db93_4c9cf43c-6770-446b-aab8-0abf9e66d4ed.pdf

several years at a time (FAO, 2006)[3]. Further, before 1994, the first 27 m^3 of household water consumption was free of charge and lower tariffs were charged to vulnerable consumers, such as pensioners and people receiving social assistance. Meanwhile, industry and agriculture extracted their own water, sometimes illegally (FAO, 2006).

Tariffs for household consumption were increased in 1997 and 1998/1999. In 2000, water resources were placed under the regulatory control of the Malta Resources Authority (MRA), to take steps towards securing the quality and quantity of water resources (MWA, 2015a). In Malta's first River Basin Management planning period, following the publishing of the first Plan ("1st Water Catchment Management Plan") in 2011, a number of measures were gradually introduced to promote a more efficient and sustainable use of water resources, including, for instance, smart metering on the potable water distribution network and metering of groundwater abstraction sources operated by agricultural and commercial sectors (Energy & Water Agency, 2016).

Malta also introduced a national scheme of **water supply and water metering fees** to encourage more sustainable water use.

Water supply fees
All constant water supplies in Malta are measured by a meter, to allow water use to be measured and the correct level of tariffs to be charged. The water supply tariffs are applied to water users based on the amount of water used. Tariffs have been amended several times, including at the start of 2010 and in March 2014 (see Table 1). Tariff changes have not always led to increases; 2014 saw a reduction in the tariffs charged (following a pledge by the then-opposition Labour party prior to the 2013 election).

A 'rising block' structure is used: water use to a certain volume is charged at one rate, and water use exceeding that volume is charged at a higher rate. It should be noted, however, that the highest non-residential water users benefit from a reduced tariff for water consumption over and above 40,000 m^3 per year.

A flat-rate annual service charge is also applied to each user (see Table 1).

[3] Prices were changed four times between 1987 and 1999 (with no price changes from 1987-1990 or 1994-1996).

Table 1 Water supply tariffs in Malta (2009-2016), EUR per m^3

Type of consumer[4]	Annual service charge			1st tier consumption			2nd tier consumption			3rd tier consumption		
	To 31/12/09	From 1/1/10	From 31/3/14	To 31/12/09	From 1/1/10	From 31/3/14	To 31/12/09	From 1/1/10	From 31/3/14	To 31/12/09	From 1/1/10	From 31/3/14
				≤ 33 m^3/cap./year			> 33 m^3/cap./year					
Residential	59			1.40	1.47	1.3965	5.15	5.41	5.1395	n/a		
Domestic	59			2.00	2.30	2.1850	5.15	5.41	5.1395			
				≤ 168 m^3/year			169 m^3 to 40,000 m^3/year			> 40,000 m^3/year		
Non-residential	59		130	1.75	2.10	1.995	2.15	2.50	2.375	1.40	1.75	1.6625

Sources: Times of Malta (2009) and REWS (2016)

[4] 'Domestic' rates are applied to one primary residence, one secondary residence and one small garage used only for private, non-commercial purposes. The reduced 'residential' rates apply when one or more people are registered on a domestic premises account. Any service not registered as domestic or residential is charged at the non-residential rate (including all companies). (ARMS Limited, 2016)

Self-supply of water for own agricultural, industrial or household use (i.e. water not obtained from the public supply) is typically metered but is exempt from the water abstraction fees (Arcadis et al., 2012). However – subject to a specific request and approval – the WSC may supply non-potable water for agricultural and industrial use from public boreholes at a rate of EUR 0.093/m^3, and for construction or other purposes at a rate of EUR 0.932/m^3. These rates do not include additional charges for carrying and/or distributing such water (Government of Malta, 2015).

Water metering fees

The 2010 Maltese Groundwater Abstraction (Metering) Regulations aimed to bring about better monitoring of groundwater abstraction (Government of Malta, 2012) and established a requirement for the metering of all significant groundwater abstraction sources (Energy & Water Agency, 2016)[5]. Although the installation of a meter does not confer any vested rights to abstract groundwater from the source, according to Marco Cremona, Committee Member of the NGO "Malta Water Association", many owners of registered and metered boreholes believe the contrary (Cremona, personal communication, 2016). The Malta Resources Authority retains the right to order the closure and sealing of a groundwater source or to limit the abstraction of groundwater from any source for any reason, but no action has been taken by authorities to close or limit the extraction of water from private boreholes (Cremona, personal communication, 2016).

The 2010 Regulations introduced the metering fees outlined in Table 2, which remain in place to date.

Table 2 Water metering fees in Malta (2016)

Type of fee	Amount per item (EUR)
Meter installation for each groundwater source	765
Annual metering fee per groundwater source	143
Application to Water Service Corporation for testing a meter	50
Application to Water Service Corporation for temporary suspension of metering	100
Application to Malta Resource Authority for closure, sealing and decommissioning of a groundwater source	50

Exemptions on metering (and associated fees) are granted if:

- No mechanical pump or device is installed or used to abstract groundwater;
- The user proves that the water is used for a cultural property (as defined under the Cultural Heritage Act); or
- The source is used for domestic purposes only (and abstraction yield does not surpass 1m^3 per day and the source abstracts groundwater from the perched aquifer[6]).

[5] The Regulations state that all groundwater sources in use since before 1955, all validly registered or notified groundwater sources, and sources in use or constructed before the entry into force of the Malta Resources Authority Act, and which are used by the WSC, shall be metered by the WSC or its delegated contractor (Government of Malta, 2015).

[6] I.e. shallow wells above sea level, known as *spira* (plural *spejjer*) in Maltese, and not the larger mean sea level aquifers. Some of these wells were dug centuries ago and water is used mainly for domestic purposes. The

1.2 Drivers and barriers of the instrument

The high level of water stress in Malta has been a significant driver for the development of instruments, including water pricing (MWA, 2015b). Malta has the lowest natural freshwater availability per person and year of all EU Member States, with a long-term annual average[7] of about 94 million m^3 freshwater (around 216 m^3 per inhabitant) (calculated from Eurostat, 2016a and Eurostat, 2016b). It is one of eight countries in Europe assessed as being 'water-stressed' (EEA, 2008). According to the 2nd Maltese Water Catchment Management Plan, reasons for the low availability of freshwater include both natural factors such as the semi-arid climate and barriers for aquifer recharge due to the high urban density and impermeability of urban land-use. Being the most densely populated of all EU Member States – and an increasingly popular tourist attraction – pose additional challenges in terms of over-abstraction of groundwater (Energy & Water Agency, 2016).

Malta's accession to the EU in 2004 was another major driver for the introduction of water pricing. Maltese legislation was amended to comply with EU laws including the Water Framework Directive and the Groundwater Directive (see e.g. Scicluna, 2015). According to the FAO (2006), preparations for EU accession led to a comprehensive legal framework addressing groundwater management for the first time in Malta's legal history.

The 2006 FAO report – produced in collaboration with the Malta Resources Authority – has been influential in the reform of water pricing. The report aimed to generate discussion among stakeholders, contribute to the development of a national water policy and a Maltese groundwater management strategy, and ensure Malta's compliance with the Water Framework Directive. It called for all groundwater users to be regulated, including the registration of all boreholes, issuing of licences, and the introduction of tariffs and other demand-management instruments (FAO, 2006).

A risk of further salinization of groundwater, due to the unregulated private abstraction, was a motivating factor for the introduction of legislation in 2007 to register and licence all private groundwater abstraction sources, and to meter boreholes used for commercial and agricultural purposes (MWA, 2015b). Whilst private wells for domestic and industrial use now require a permit, the same does not apply to private wells for agricultural use (Easton, 2013).

The historical exemption from water fees for the agriculture sector, despite the sector's relatively small contribution to national GDP (EEA, 2015), may be a barrier for changes to water pricing for the sector. There are political/electoral motivations for maintaining lower, undifferentiated tariffs (Roberts et al., 2015) and/or exemptions for the sector. It has been pointed out that private groundwater abstraction has not been regulated and monitored adequately (e.g. European Commission, 2012; Scicluna, 2015). In 2012, the European Commission pointed out that plans to start charging for self-abstraction from 2011 had not been confirmed (European Commission, 2012); this remains the case at the time of writing of this case study.

amount of water that can be abstracted from such wells is limited by the replenishment rate and abstraction does not affect the deeper mean sea level aquifers. (Cremona, personal communication, 2016)

[7] The minimum period taken into account for Eurostat's calculation of long term annual averages is 20 years (Eurostat, 2016c).

Finally, the **previous history of providing a certain volume of water to households for free may still act as a barrier to increasing household water tariffs**.

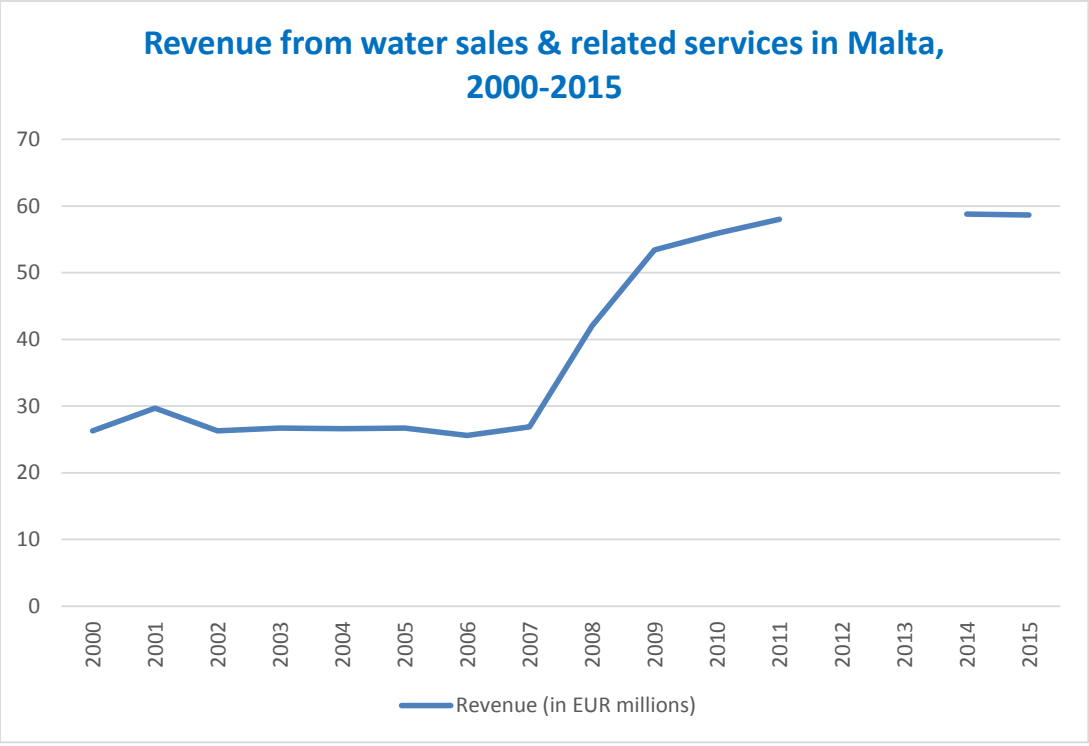
1.3 Revenue collection and use

Water supply tariffs are paid by water users receiving potable and non-potable water from the public supply. They are collected by ARMS Ltd., a subsidiary to the Maltese Water Services Corporation (WSC) (WSC, 2016a).

Revenue from the sale of water and related services amounted to almost EUR 59 million in 2014 and 2015 respectively. In 2011 (the latest year for which more detailed data is available), the WSC received around EUR 58 million in revenue from sale of water and related services; around 50% of which came from the residential sector, 29% from the non-residential sector and 21% from the domestic sector. Variable consumption charges accounted for 70% of revenue, whilst fixed annual charges accounted for 30%. The non-residential sector still accounts for around 30% of revenues generated through water pricing (Energy & Water Agency, 2016).

Revenue figures for 2000-2015 are shown in the figure below (note that data has not been found for 2012 or 2013)[8].

Figure 1 Revenue from water sales & related services in Malta, 2000-2015



Source: calculated from WSC Annual reports (2001-2 to 2011)

[8] Notes on the figure: The financial year end was changed in 2008 to December 2008, so the figure for 2008 covers 15 months. Tariff revisions for the financial years 2009 and 2010 explain the significant increase in revenue in those years.

In 2014, consumer charges recovered around 88% of the total costs of water services in Malta. In 2010, 16 million m^3 of water consumption from the WSC was billed (i.e. water supply charges were applied to this quantity of water). Households accounted for about 70% of total billed consumption, the services sector (Government, tourism and commercial sectors) accounted for 14%, agriculture 3% and industry 5%. It should be noted that these figures only take into account water from the public water supply; data on consumption from groundwater supplied by private water suppliers is not available (ERA, 2011). In addition, it must also be noted that the WSC has benefited from EU Structural Funds and the Italo-Maltese protocols for use in its capital infrastructure investments (Cremona, personal communication, 2016).

1.4 Environmental impacts and effectiveness

For many years, water pricing had little or no impact on household water consumption, potentially due to the Government policy of maintaining household water tariffs at a stable rate for several years at a time, and of providing the first 27 m^3 of water free of charge until 1994 (FAO, 2006). According to the 2nd Maltese Water Catchment Management Plan, groundwater abstraction remains a significant pressure for the country's two main mean sea level aquifer systems, which still suffer from over abstraction and related sea-water intrusion impacts (Energy & Water Agency, 2016).

Total Maltese water demand was estimated to 62 million m^3 in 2014, supplied by groundwater abstraction (61%), reverse osmosis (RO) (29%), rainwater harvesting (7%) and wastewater collection and treatment (3%) (Energy & Water Agency, 2016). The change in water demand over time and per sector is shown in Figure 2.

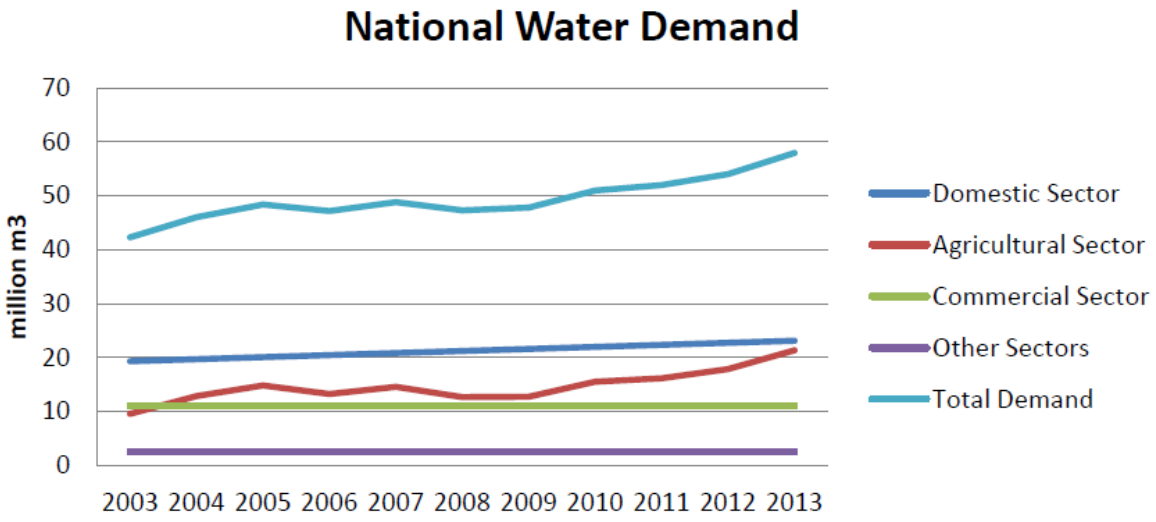


Figure 2 Trends in national water demand between 2003 and 2013 (Energy & Water Agency, 2016).

The Malta Water Services Corporation (WSC) is responsible for the distribution of drinking water, its production through RO, wastewater collection and treatment. In 2015, the WSC

produced about 30 million m^3 of potable water in the Maltese Islands. Around 43% (13.4 million m^3) was extracted from groundwater aquifers (pumping stations and boreholes) with 58% (just under 18 million m^3) produced via desalination in three RO plants (WSC, 2016b). Figures on the WSC's production of potable water for several previous years are provided in Table 4 below.

Notably, the NGO Malta Water Association (MWA)[9] claims that total water consumption in Malta, including self-abstraction, may be in the order of 100 million m^3 per year if various unknown factors were to be taken into account (Cremona, personal communication, 2016).

Table 3 Production of potable water in Malta (2001-2011)

Period	Groundwater	RO plants (desalination)	TOTAL
2011	12,947,193 m^3	16,721,969 m^3	29,669,162 m^3
2010	12,652,802 m^3	16,109,456 m^3	28,762,258 m^3
2009	12,535,674 m^3	16,645,753 m^3	29,189,363 m^3
Aug 2007 – Jul 2008	13,937,703 m^3	16,873,885 m^3 (NB Jan-Dec 2008)	30,809,614 m^3
Aug 2006 – Jul 2007	13,417,160 m^3	16,974,914 m^3	30,310,745 m^3
Aug 2005 – Jul 2006	13,389,671 m^3	17,445,292 m^3	30,789,335 m^3
Aug 2004 – Jul 2005	14,343,908 m^3	17,022,073 m^3	31,365,981 m^3
Aug 2003 – Jul 2004	15,115,622 m^3	18,901,922 m^3	34,017,544 m^3
Aug 2002 – Jul 2003	15,755,930 m^3	18,228,109 m^3	33,984,039 m^3
Aug 2001 – Jul 2002	16,211,811 m^3	17,824,857 m^3	34,036,668 m^3

Source: WSC Annual reports (2001-2 to 2011)

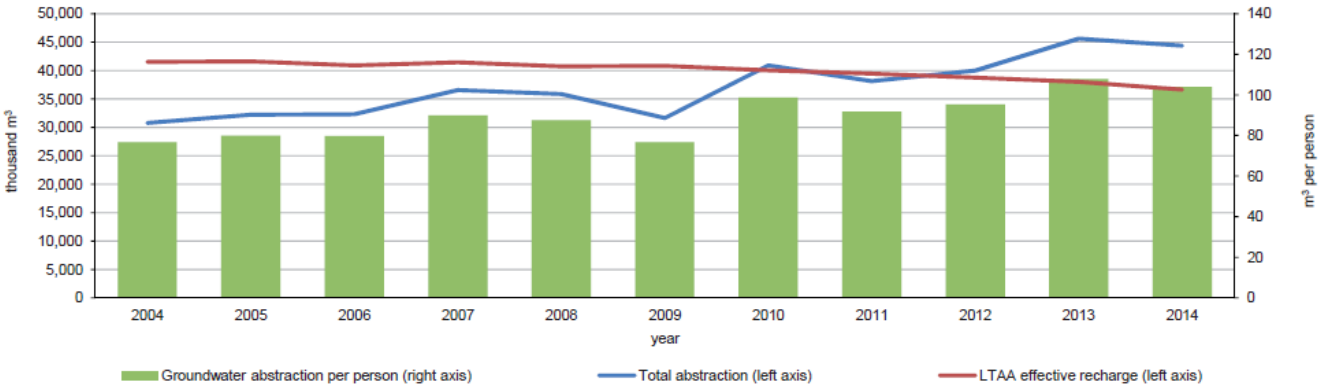
Total gross groundwater abstraction (i.e. including abstraction not through the public water supply) increased between 2003 and 2013 from just over 32 million m^3 to 45 million m^3 (Eurostat, 2016d). Between 2005 and 2014, this represented an annual increase in abstraction of 4.3%, and a corresponding annual increase of the Maltese Water Exploitation Index (WEI) of 4%, reaching 46.5%[10] in 2014 (NSO, 2015a). In the period 2004-2014, groundwater abstraction per capita increased by 35%, from just under 77 m^3 to 104 m^3. Over the same period, the effective recharge of aquifers (the volume of water added to aquifers from natural and other sources) declined by 1.2% per year on average – see Figure 1 below (NSO, 2015b).

According to MWA, the abstraction of groundwater remains cheaper than desalinated water, arguing that it may make it economically preferable to users and lead to its continued use and the continued deterioration in quality (MWA, 2015b).

[9] The Malta Water Association (MWA) is an NGO/think-tank bringing together water, sustainability and legal professionals. It was formed in 2011 in response to the country's precarious water resources. The MWA aims to communicate, educate, develop knowledge, and raise public and political awareness on the sustainable use and management of water resources.

[10] The water exploitation index (WEI) is the total water abstraction as a percentage of the long-term available annual (LTAA) freshwater resource. According to the EEA, a WEI over 20% indicates a stressed country, whilst over 40% indicates a severely water stressed country with unsustainable water use.

Figure 3 Groundwater abstraction in Malta, 2004-2014



Source: NSO, 2015b

Whilst about half of public water supplied is provided from groundwater and half from desalinated water, the agriculture sector uses mostly groundwater and some surface water (Easton, 2013). Self-supply of groundwater for agricultural use almost doubled from 13.5 million m^3 in 2004 to 27.5 million m^3 in 2014 (NSO, 2015b).

The quantity of fresh surface water and groundwater used for public water supply has been relatively stable over the same period, ranging from about 13 to 15 million m^3 per year (NSO, 2015b) – see Table 3.

Table 4 Groundwater abstraction by year and sector (2004-2014)

thousand cubic metres

Groundwater	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total abstraction	**30,803**	**32,246**	**32,317**	**36,587**	**35,851**	**31,656**	**40,894**	**38,154**	**40,008**	**45,614**	**44,393**
Public water supply	14,887	13,995	13,059	13,958	14,076	12,677	12,784	13,061	13,299	13,788	13,963
Agriculture (for irrigation)	13,506	15,908	16,953	20,298	19,250	16,545	25,653	22,551	24,055	29,020	27,526
Manufacturing industries	914	862	820	816	969	902	858	907	966	1,047	1,092
Services	489	468	470	495	529	497	561	591	635	695	746
Households	1,007	1,013	1,014	1,020	1,028	1,035	1,038	1,044	1,054	1,064	1,065
LTAA effective recharge	41,521	41,628	40,918	41,434	40,725	40,812	40,034	39,447	38,764	38,000	36,646
Groundwater abstraction per person in m^3	76.8	79.8	79.7	89.9	87.6	76.7	98.6	91.6	95.4	107.7	103.9

Note: Groundwater abstraction per person for 2014 is provisional.
Sources: Water Services Corporation; National Statistics Office.

Source: NSO (2015b)

A recent university dissertation using remote sensing to assess groundwater use suggests that almost 11% of all agricultural land in Malta may be linked to illegal water abstraction (Cremona, personal communication, 2016). The WSC is expected to make available a further 7 million m^3 annually of treated sewage effluent suitable for irrigation, but MWA has not seen any indication of whether there will be a charge for this water, whether it will directly substitute self-abstraction, and/or whether it will only be available to farmers who close their private boreholes (Cremona, personal communication, 2016).

Leakages from the water supply infrastructure have been reduced by 66% from approximately 10 million m^3 in 2002 to 3.5 million m^3 in 2014 (Energy & Water Agency, 2016), which has

helped to increase the availability of water resources, thereby reducing the amount of water that the WSC needs to produce through both groundwater and desalination sources.

As figures have not been found for the quantity of billed water over time, it is not possible to develop a figure illustrating how this correlates with the water charges. Based on the available information however, the water supply and metering fees do not seem to have had much of an impact on the amount of water provided through the public water supply. In fact, total groundwater abstraction has increased, while self-abstraction from groundwater sources by the agricultural sector for irrigation purposes doubled between 2004 and 2014, as indicated above. Self-abstraction by the industrial sector and services sector also increased over the same period (by around 19% and 53% respectively), whilst self-abstraction by households remained largely stable.

Since self-abstraction of groundwater is not subject to the water supply and metering fees, the water supply fees may be acting as an incentive for self-abstraction. It has been estimated that private abstraction costs (including drilling costs, pumping equipment, energy use etc.) for abstraction rates lower than around 300 m^3 per year (e.g. for small farms) are higher than the municipal non-residential water tariff. For abstraction volumes above that amount, self-abstraction would be cheaper (Energy & Water Agency, 2016).

The abstraction of groundwater at a rate above the natural recharge rate (over-abstraction) in Malta both depletes the resource and is contributing to seawater slowly permeating the island's aquifers, increasing the salinity of groundwater. Nitrate concentrations are also increasing due to nitrates from fertilizers and animal waste leaching into the aquifers. According to the NGO MWA, better control of groundwater abstraction (including metering of boreholes) should increase the efficiency of water use and lead to the increased use of alternative water sources, such as harvested rainwater and treated sewage effluent (MWA, 2015b).

1.5 Other impacts

No specific information has been found on the economic or social impacts of Maltese water pricing. However, rising block tariffs, such as the ones applied in Malta, are often considered more equitable for residential consumers and low-income users, since lower volumes of water use are charged at a lower rate, with higher-volume users paying more. In addition, the pre-1994 pricing structure (with the first 'block' of household water consumption up to 27 m^3 provided free of charge), and lower tariffs for vulnerable consumers (e.g. pensioners and people receiving social assistance) which were in place until at least 2005, were an attempt to take distributional impacts of water pricing into account. However, the technical argument for this structure can be questioned, as use of one unit of water at a lower (or free) tariff cannot be directly distinguished from a unit of water used at a higher tariff in terms of its environmental impacts or economic costs (e.g. cost of production and supply).

Competitiveness concerns have been raised over tariffs for industrial users (see next section). Non-residential users with the highest level of consumption benefit from a reduced tariff, and agricultural water use is not generally subject to abstraction fees. Since this reduces the cost of water to these sectors, it presumably provides them with a competitive advantage (although no specific information has been found on this).

2 Stakeholder engagement and Windows of opportunity

From the mid-1990s, awareness began to increase about the need to use water optimally and to make users more accountable for their water consumption, thereby achieving better cost-recovery and helping water conservation to become more mainstream (FAO, 2006). Also according to Easton (2013), awareness about unsustainable water use in Malta has increased over time, and several campaigns undertaken by groups and individuals have led to action and political progress.

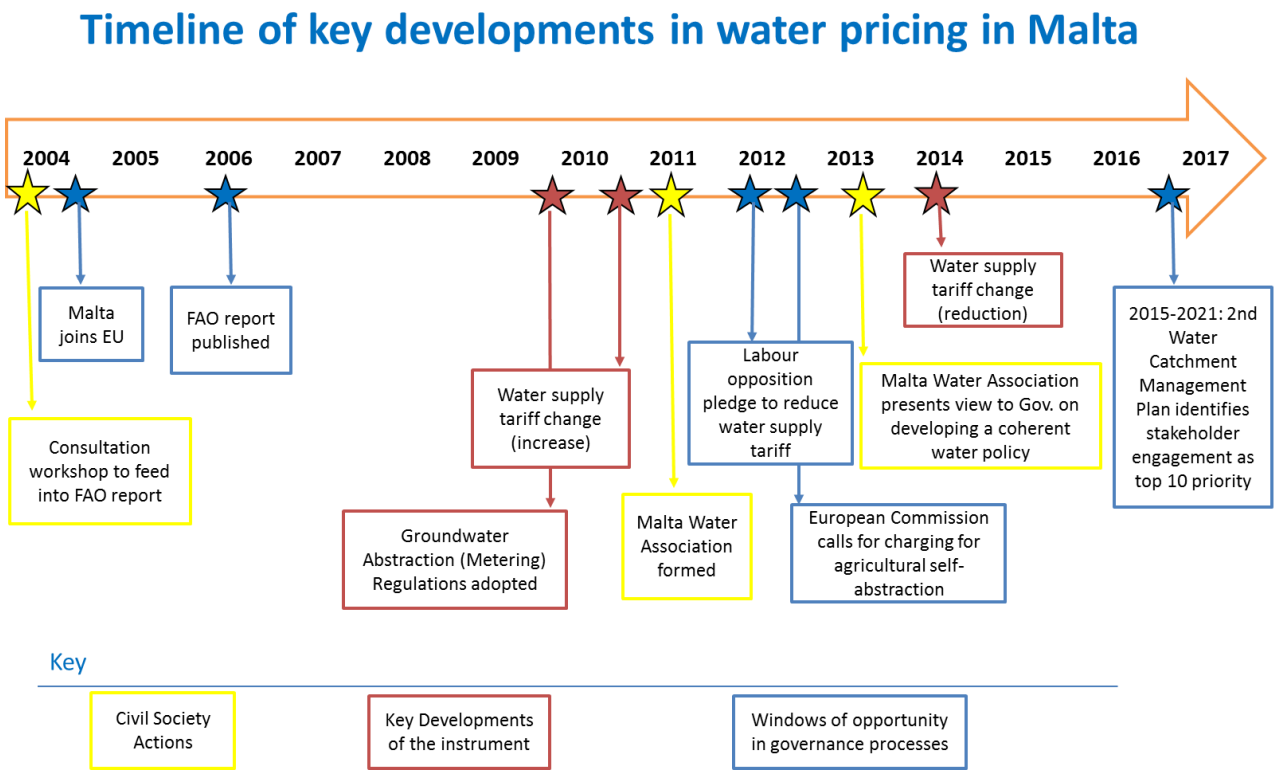
Opinions diverge about Malta's water pricing policy and its evolution, and various stakeholders have expressed their concerns in the national news. For example, Alternattiva Demokratika (the Maltese green party) expressed concern about the impacts of proposed increased water tariffs in 2008, arguing they would be detrimental to households, SMEs and industry; the Labour party also argued they would impact on industry (Times of Malta, 2008a). Also in 2008, unions argued that consumers should not be made to pay for inefficiencies in water production and distribution (Times of Malta, 2008b). In 2010, the leftist movement Żminijietna – Voice of the Left argued that the existing water pricing strategy seemed to be 'lenient with those causing damage to the environment [i.e. high-volume industrial users] and tough with those households that consume the basic amount of water' (Times of Malta, 2010). At a national conference on water consumption and scarcity held in June 2012, the Malta Chamber of Commerce, Enterprise and Industry argued that raising the price of water is one of the best ways to promote water conservation, but that the impact of high tariffs on businesses must be taken into account (Times of Malta, 2012). Meanwhile, many key stakeholders (e.g. farmers, hoteliers, industrial consumers) benefit from the lack of charging for self-abstraction (Cremona, personal communication, 2016) and could be expected to oppose significant changes to this status quo.

Shortly after the 2013 election, the Malta Water Association (MWA) NGO presented a document to the new Government concerning the development of a coherent water policy framework. This was followed up by a report in 2015 by the Today Public Policy Institute (TPPI), arguing that Malta needs an integrated national policy framework on water based on reliable data and facts. The report argues that, while stakeholders have been consulted in the development of policies related to water, the absence of a sound analytical framework and robust data may lead to policy dictated largely by vested interests and political electioneering (Roberts et al., 2015). See section 4.2 below for some of the report's recommendations. The development of a nation-wide policy framework on water is still stalled[11].

Although not specifically related to the water pricing instruments, the 2nd Water Catchment Management Plan identifies stakeholder engagement as one of its ten priorities for 2015-2021. It mentions the need for the Plan to be 'owned' by stakeholders, and for a long-term educational campaign for users (and the younger generation) on the value of water

[11] In addition, there is no official agricultural policy in Malta. The lack of water and agriculture policy frameworks means that no formal link between the two sectors has been made in policy terms and it is not possible to draw firm conclusions on the impact of agriculture on the country's water resources (Cremona, personal communication, 2016).

conservation. This could provide an opportunity for stakeholders to engage with the relevant authorities about water use, and potentially allow them to express their views on instruments that support Maltese water policy (Energy & Water Agency, 2016). In the creation of the 1st Water Catchment Management Plan, public participation was carried out extensively, including the active involvement of the relevant stakeholders (European Commission, 2012).



3 Insights into future potential/reform

3.1 Actual planned reforms and stakeholder engagement

The regulatory authority is currently developing a proposal to bring about full cost recovery for water services in Malta, through a combination of consumer pricing, application of the 'user pays' principle and government funding to reflect the environmental benefits of groundwater conservation due to the WSC's activities. This will include financial incentives to further reduce losses and enhance the recycling of water resources. Implementation of the programmes of measures under the latest Catchment Management Plan is expected to shift the water supply base towards more alternative resources and to reduce the dependency on groundwater from the current 61% to an estimated 47% (Energy & Water Agency, 2016).

However, due to apparent concerns over potential disproportionate impacts on certain 'vulnerable yet strategic' sectors (mainly agriculture) and a view that pricing does not necessarily contribute to protecting the sustainability of groundwater resources (Energy & Water Agency, 2016), it is not yet clear what changes, if any, will be made to the structure of water pricing in Malta. The MWA has raised concerns that any significant increase in the WSC water supply tariffs may simply result in users using the WSC supply less and turning to increased self-abstracted water (Cremona, personal communication, 2016). In the absence of

data on self-abstraction rates, this may give the impression that increased prices had led to greater water efficiency, when in fact the opposite could be true.

3.2 Suggestions for future reform – instrument design and civil society engagement

The Energy & Water Agency and WSC are currently undertaking a study to obtain the meter readings from all metered private boreholes operated by economic operators during at least a 12-month period (Energy & Water Agency, 2016). The authors of this case study suggest that **this information could be used to inform future pricing reforms**, since it will provide a picture of water use by different operators/sectors.

Since agriculture is the major water using sector in Malta – but a relatively small contributor to national GDP – **there is a case for considering the introduction of increased charges for water provided through the public supply for agricultural use, and introducing charges for self-abstraction of water by the sector**. The EEA (2015) has argued that private water supplies need to be billed to achieve sustainable water use. The European Commission (2012) has also argued that efforts should be made towards transparent cost-recovery (including environment and resource costs) for a range of water services, including self-abstraction for agricultural purposes. The TPPI argues that since agriculture is the major user of Malta's groundwater, analysis is needed to properly understand farmers' water use 'in terms of economic and income contribution, efficiencies, market competitiveness, and social value' (Roberts et al., 2015). However, the introduction of (increased) charging for agricultural water use would inevitably be difficult, due to the historical exemptions/low rates for water use by the sector.

Also other recommendations made by previous, more comprehensive, studies merit mentioning here. The 2015 TPPI report argues, *inter alia,* that a National Water Plan should:

- recognise 'the real value of water and its economic contribution';
- make the link between 'water management and the agricultural sector'; and
- take into account 'social, environmental and income factors' and 'financial issues, including tariffs, revenues and the levels of justified subsidies to water users' (Roberts et al., 2015).

Further, the report argues that problems with the existing water tariffs include:

- the presence of several uncalculated and hidden subsidies;
- no justification of the tariffs based on the economic value of water; and
- the differentiation between household and commercial tariffs not taking into account how water use contributes to commercial profit.

It suggests that re-calculated tariffs should make a rational link between the value of water and its usage, by: taking into account water's contribution to income and its social value; reflecting the economic costs of water generated by different means, including the environmental costs of energy production for desalination and of groundwater abstraction (both public and private) from overexploited aquifers; and sending economic signals so water is used for the most beneficial purposes (e.g. by recognising the basic right to water, protecting low income users, favouring low consumers, and penalising wastage/excessive

use[12]). Finally, the report suggests that in a water-stressed environment such as Malta, water tariffs should be set at a rate that most can afford, and subsidies applied to lower-income households (Roberts et al., 2015).

It appears that Maltese decision-making on water policy and management could be made more transparent. The MWA suggests that it is not clear to the public which authorities are responsible for which aspects of water, or which Government department is responsible for water (Cremona, personal communication, 2016).

3.3 Suggestions for replicability

Water pricing in Malta is relatively specific to national circumstances (such as high level of water stress, significant reliance on desalination as a source of water, lack of charging for private water abstraction which makes up a significant proportion of abstraction, etc.). This makes it difficult to take broader lessons from this case for application in other EU Member States.

However, one general lesson to be learned is that private/unregulated/unmonitored/illegal water abstraction can significantly reduce the effectiveness of water pricing and lead to a substantial amount of lost revenue. Water pricing should therefore aim to address this issue as far as is practicable.

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[12] The annual swimming pool license fee is mentioned as an example of a useful instrument in this regard. Charges in 2014 were as follows: EUR 4.60/m^3 of fresh water for domestic pools; EUR 6.90/m^3 of fresh water for commercial pools; EUR 100 to fill domestic pools with sea water (EUR 600 for commercial pools). In 2013, €772,104 was collected in license revenue according to Malta Today (2014).

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