

The Water Capacity Subsidy that the City of Norman, Oklahoma Provides New Real Estate Development: A Descriptive Analysis

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Introduction

During the holiday season of 2014-15, the City of Norman, Oklahoma adopted a mechanism by which it will pay for new water capacity. On November 25, 2014, the City Council adopted Ordinance O-1415-18 to increase water connection fees in order “to provide additional funding to cover costs associated with new connections to water service” (Text File O-1415-18). On January 13, 2015, the citizens of Norman voted to increase water utility rates and authorize using \$9 million from those to pay for the new water capacity needs of current utility customers (Text File O-1415-16). Even a cursory review of this mechanism establishes that new real estate development will be paying a lower unit price for water capacity than current water customers: new development will start paying \$3.92/gallon per day for new capacity after the 2016 building season; current customers will pay at least \$9 million for, at the very most, 2.2 million gallons per day in capacity, for a unit price of \$4.09/gallon per day.¹ Further, despite City staff assurances,² it is also clear that the price schedule adopted in the new connection fees will *not* be sufficient to cover the actual cost of providing new water capacity for future development in Norman.

¹ These calculations and more are below.

² According to City staff, “these proposed connection fee increases are expected to be sufficient to fund the portion of well costs attributed to new capacity” (Text File O-1415-18).

In this paper, I argue that providing new water capacity to some stakeholders at a price that is below *either* the price charged other stakeholders *or* the actual costs of providing new water capacity constitutes a subsidy. This holds regardless of possible justifications for such a pricing scheme. Getting clear on the descriptive issue of who is paying for what in such a context is a necessary first first step in normatively evaluating government mechanisms for providing goods or services. Toward this end, I describe some of the implications of the water capacity subsidy in detail.

Conceptual Issues

The basic idea of a *subsidy* is clear enough: subsidies are a kind of support or assistance, usually financial. Governments, for example, subsidize access to certain goods or services for certain stakeholders by paying, at least partially, for those things.³ Some people characterize voluntary exchange as assisting each individual involved. Not all such transactions involve a subsidy, however. A key feature of subsidies is that they are *intended for the benefit of the recipients*. This means that the advantage of the recipient - even if it is seen as merely instrumentally valuable - must be a primary purpose of a subsidy provider.⁴ It would be inconsistent with offering a subsidy, for instance, to try to take advantage of a recipient by leveraging her into a bad spot. Focus on the recipient's good is important in clarifying the distinction between a subsidy and a run-of-the-mill purchase or contract. In a standard exchange, each participant need only be concerned with her own well-being and how the consideration offered affects it; a subsidy is a sort of gift or grant, however, so the provider need not receive consideration and retains no control. Being directed at the interest

³ At the Federal level, for example, the Affordable Care Act subsidizes the provision of healthcare for some less wealthy persons by partially paying for their insurance coverage (see, e.g., the definition of "subsidized coverage" at <https://www.healthcare.gov/glossary/subsidized-coverage/>).

⁴ Note that this does not require that providers be motivated by pure altruism or have no ulterior motives.

of the recipient, the subsidy provider volunteers her support without any ‘strings’ and ‘casts her bread the water’ in so doing.⁵ Summing up these intuitive criteria, we can say that a subsidy is

- (1) assistance for an entity (person, group, project, etc.);
- (2) for the benefit of that entity; and
- (3) not a deal or contract; the provider is not acting for consideration in return, and retains no control over the recipient.

To subsidize an entity is to assist it in an effort to see *it* succeed (whether that is the ultimate goal or not).

Controversy as to whether a particular program constitutes a subsidy usually depends on an *economic* notion: a subsidy is assistance that keeps prices favorable for the supported entity (low for consumers; high for producers) relative to the benchmark of a perfectly competitive market equilibrium (De Moor). On this view, subsidies are *ipso facto* inefficient and, as a result, undesirable.⁶ Adopting this economic account is a mistake for policy analysis. In the first place, economic efficiency is a poor normative benchmark (Ellis & Hayden). More importantly, there is no reason to depend on a normative benchmark. Treating subsidies as *bad by definition* does not fit well with the way policy makers use the notion - a number of policies that are appropriately characterized as subsidies are (arguably) well justified. A nation, for example, could successfully argue that subsidizing an industry is necessary to internalize an externality. Likewise, a subsidy designed to assist some group might be

⁵ This helps explain why subsidies are so often asymmetric: one party provides the grant of aid for the purpose of benefitting the other. Reciprocal subsidies, however, remain a possibility. Suppose, for example, an elderly relative **A** offers to pay for part of student **B**'s college tuition in order to allow **B** to work less. This qualifies as a subsidy **A** gives to **B**. Imagine further that **B** accepts **A**'s offer, in part, to help give **A** a sense of connection and relevance that she seemed to have lost recently. **B** might well be subsidizing **A**'s social life.

⁶ International trade law, for example, is full of cases where one nation accuses another of providing a subsidy and the second nation denies the charge by arguing that its support for an industry promotes efficiency, and so is not a subsidy.

appropriate regardless of economic efficiency considerations, e.g., it might be required by justice. Making the application of the term "subsidy" depend on an overall policy evaluation both makes it difficult to characterize policies under consideration and makes those characterizations inherently contentious. Better to understand a subsidy as gift designed to provide assistance and argue from there about normative considerations.

Norman's Water Capacity Needs

Any analysis of how Norman pays for the water capacity used by new real estate development (*NRED*) must start with the fact that Norman does not presently have sufficient capacity for its own current water customers (*CWC*). According to Norman's 2060 Strategic Water Supply Plan (SWSP), the 2015 demand for water will be between 16.4 million and 16.7 million gallons per day (gd) in average-annual terms.⁷ At the present time, Norman can provide an average annual supply of 14.5 million gd from its own resources.⁸ The SWSP says, therefore, that the capacity shortfall will be between 1.9 million gd and 2.2 million gd in average annual demand.⁹

The fact that Norman does not have sufficient water capacity for *CWC* also was made clear in the campaign leading up to the January 13, 2015 Water Rate Election. According to City Staff, of the \$12 million budgeted to provide 2 million gd in new water capacity in the proposed water bond, 75% is for *CWC* (Presentation on Water Connection Fees, September 30, 2014; Presentation on Water Connection Fees, October 16, 2014; Text File for

⁷ Gallons per day(gd) is a standard measure of water capacity. In this document, I will be converting other measures to this standard. The 2015 *peak day* demand will be 31.2 million to 31.7 million gd (SWSP 2-17). That is 16.4/16.7 million gd multiplied by a 1.9 *peaking factor* that captures maximum daily demand on the water supply system (SWSP 2-7).

⁸ 8.5 million gd from Lake Thunderbird - this is expected to fall to 6.1 million gd as early as 2016 - and 6 million gd from active wells (SWSP 3-3, 3-4, 3-9). Norman can provide a peak day supply of 25 million gd from its own resources at the present time: 16 million gd from lake Thunderbird - this is also expected to decline in the near future - and 9 million gd from active wells (SWSP 3-3, 3-4, 3-9).

⁹ According to the SWSP, capacity shortfall will be from 6.2 million gd to 6.7 million gd in peak-day terms.

O-1415-16; Text File for O-1415-18). The City allocated \$9 million from the rate increase for new water capacity for CWC, so it appears that 1.5 million gd was the estimate of current need (in terms of annual average yield).¹⁰ Using City of Norman source materials, then, it appears that CWC have a current need for between 1.5 million gd and 2.2 million gd in annual average water capacity.¹¹

The Actual Cost of Supplying New Water Capacity

As a result of the January 13, 2015 Water Rate Election, the City of Norman has effectively budgeted the cost of drilling a new well field over the next few years at \$6.00/gd: \$12 million for 2.0 million gd (Presentation on Water Connection Fees, September 30, 2014; Presentation on Water Connection Fees, October 16, 2014; Text File for O-1415-16; Text File for O-1415-18). There has, however, been a huge range of cost estimates discussed in City documents. The lowest cost anyone has discussed is \$4.00/gd - this is the historic cost from the last set of wells Norman drilled (Presentation on Water Connection Fees, September 30, 2014). In campaign literature, the highest yield the City of Norman cited for a \$9 million investment is 1.75 million gd, which works out to be a price of \$5.14/gd ($\$9,000,000/1,750,000$ gd) (City of Norman Water Rate Increase Special Election January 13, 2015 brochure). An earlier City budget for new capacity, however, said that it would take \$14 million to get 2 million gd, for a price of \$7/gd (Finance Committee Minutes, September 11, 2014). The SWSP itself suggests a much higher cost to make new wells operational - over

¹⁰ Peak day capacity shortfall was not addressed during the campaign. Peak day *demand* is 1.9 times average annual demand; peak-day *supply* for new wells is something like 1.5 times average annual supply (e.g., existing wells supply 6 million gd on an average annual basis and 9 million gd on a peak day basis). If, as City figures suggest, CWC will demand 16 million gd on an average annual basis then the peak day demand will be 30.4 million gd (= 16 million gd × 1.9), 5.4 million gd over Norman's peak day supply of 25 million gd. 1.5 million gd in new average annual capacity will add 2.25 million gd (= 1.5 million gd × 1.5) to the current 25 million gd peak day capacity for a total of 27.25 million gd new peak day capacity. The unmet peak day demand would be 3.15 million gd even after a 1.5 million gd increase in average annual capacity.

¹¹ CWC have a current need for between 5.4 million gd and 6.7 million gd peak day water capacity.

\$15/gd.¹² The City of Norman has no clear position on the best cost estimate of new water capacity.

Paying for New Water Capacity

As noted above, CWC will be spending \$9 million for new water capacity. No particular capacity is actually reserved - or even earmarked - for CWC, so there is no particular amount on which CWC can rely. NRED, on the other hand, pays for new water capacity on a per connection basis (Text File 0-1415-18). The current water connection fee is \$575 for a standard 3/4" connection.¹³ Ordinance O-1415-18 will increase the fee to \$800 for a standard 3/4" connection on August 1, 2015 (after the 2015 building season) and to \$1000 for a standard 3/4" connection on August 1, 2016 (after the 2016 building season) (Text File 0-1415-18). The "connection charge will be studied again after the 2016 increase and periodically thereafter" (Text File 0-1415-18). The City of Norman calculates that it takes 255 gd in water capacity to support a single standard connection, so the connection fee schedule amounts to unit prices of \$2.25/gd ($\$575/255$ gd) in 2015, \$3.14/gd ($\$800/255$ gd) in 2016, and \$3.92/gd ($\$1000/255$ gd) in 2017 and after.¹⁴ NRED will be allowed to purchase as many connections at these prices as developers desire.

¹² According to Table 3.6 (p. 3-19), one new well, connected to an already existing system for collecting well water for treatment, will yield 187 acre feet per year at a cost of \$2.6 million. 187 acre feet per year works out to about 167,000 gd (=187 acre-feet per yr * 893 gd/acre-feetper yr; <http://en.wikipedia.org/wiki/Acre-foot>), so the unit price would be \$15.57/gd (= \$2.6 million/167,000 gd).

¹³ There are different rates for different connection sizes, but the rates are proportional to the water capabilities of the different connections. A 1" connection, for example, carries 1.67 times the amount of water that a 3/4" connection carries, so the fee is 1.67 times as high (Memo on Water Connection Fees, September 30, 2014).

¹⁴ The 255 gd/connection figure is derived from City of Norman information about how many connections are provided by new well capacity. E.g., the City figures 2 million gd would support 7,843 connections (Presentation on Water Connection Fees, September 30, 2014). Given that both the water provided and the cost increase by the same proportion, these are the per gd charges for all sizes of connections.

It is worth noting at this point that the connection fee schedule adopted in November 2014 is insufficient to cover *any* of the cost estimates for new water capacity used by the City of Norman. Knowing the unit prices allows us to calculate the scale of the subsidy being offered. Let **C** be the actual unit cost of developing new water capacity and **Pi** be unit price paid by *NRED* in year *i*. The subsidy per unit of capacity of year *i* is

$$\text{Subi/gd} = C - P_i.$$

The per connection subsidy, then, is

$$\text{Subi/con} = 255 * \text{Subi/gd} = 255(C - P_i).$$

(See Figures 1 and 2)

Consider a situation, for example, where the actual cost of supplying water capacity is \$6.00/gd - the City's final budgeted cost. In this scenario, **Sub15/gd** = \$3.75; **Sub16/gd** = \$2.86; **Sub17/gd** = \$2.08; **Sub15/con** = \$956; **Sub16/con** = \$729; and **Sub17/con** = \$530.

CWC need between 1.5 million gd and 2.2 million gd in annual average capacity. The Water Rate Increase passed by citizens on January 13, 2015 has *CWC* providing a lump sum of \$9 million for new water capacity, so the absolute minimum unit price they will be paying is between \$4.09/gd (\$9 million/2.2 million gd) and \$6.00/gd (\$9 million/1.5 million gd) for the needed water capacity. The greatest capacity that the City has even suggested that \$9 million might buy is 1.75 million gd, so the actual minimum price will be at least \$5.14/gd (City of Norman Water Rate Increase Special Election January 13, 2015 brochure). *CWC*, therefore, are being asked to pay more for water capacity than *NRED*. *NRED*, then, is being supported by unlimited access to below-cost and below-minimum-*CWC*-price water connections.¹⁵

¹⁵ Not only are the *minimum* prices charged *CWC* higher than the prices charged to *NRED*; depending on the actual cost of supplying new water capacity and *NRED* demand, *CWC* can end up paying a much higher price than the minimum for water capacity they actually receive and/or receive much less water capacity than required. Consider a situation, for example, where the actual cost of supplying water capacity is \$6.00/gd - the City's final budgeted cost - and *NRED* purchases 832 standard connection equivalents - the number of connections that the City expects each year (Presentation on Water Connection Fees, September 30, 2014) - for each of the next three years. The total amount of money available for new water capacity,

Further, the explicit purpose of this assistance is to help *NRED* in Norman compete with housing development in other communities. Connection fee rates are tied to “concern ... that further increases in connection fees would create an unfair disadvantage to the Norman housing industry when considered in relation to other development fees charged by the City ...” (R-1415-60, section 16). *NRED* incurs no obligation in return for this benefit, so it clearly qualifies as a subsidy.

Subsidy Calculations

It is possible to calculate new water capacity available to *CWC*, the effective price paid by *CWC* for that capacity, and the total amount of the subsidy provided to *NRED*, each as a function of the actual cost of developing new water capacity and *NRED* demand for connections. Let C be the actual unit cost of developing new water capacity and D_i be *NRED* demand for water connections in year i . $T\$$, the total funding for water capacity development, is fixed by the \$9 million contributed by *CWC* and the amount demanded by *NRED*:

$$T\$(D_i) = \$9,000,000 + (\$575 * D_{15}) + (\$800 * D_{16}) + (\$1000 * D_{17})$$

TW is the water capacity that can be purchased with $T\$$:

$$\begin{aligned} TW(D_i, C) &= T\$(D_i) / C \\ &= [\$9,000,000 + (\$575 * D_{15}) + (\$800 * D_{16}) + (\$1000 * D_{17})] / C \end{aligned}$$

NW and CW are *NRED* water capacity and *CWC* water capacity, respectively:

$$\begin{aligned} NW(D_i) &= (D_{15} + D_{16} + D_{17}) * 255 \\ CW(D_i, C) &= TW(D_i, C) - NW(D_i) \\ &= \{ [\$9,000,000 + (\$575 * D_{15}) + (\$800 * D_{16}) + (\$1000 * D_{17})] / C \} - [(D_{15} + D_{16} + D_{17}) * 255] \\ &= \$9,000,000 / C + D_{15} [(\$575 / C) - 255] + D_{16} [(\$800 / C) - 255] + D_{17} [(\$1000 / C) - 255] \end{aligned}$$

then, would be $\$9,000,000 + (\$575)(832) + (\$800)(832) + (\$1000)(832) = \$10,976,000$. At \$6/gd this buys 1,829,333 gd in total new capacity. *NRED* buys 2,496 connections (=3*832), and so 636,480 gd capacity (=2,496*255 gd/connection). That leaves 1,192,853 gd capacity left for *CWC* - less that they need - and will pay \$7.54/gd (\$9 million/1,192,853) for that capacity.

(See Figure 3)

PC is the effective price **CWC** a pays for the water it receives:

$$\begin{aligned} PC(D_i, C) &= \$9,000,000/CW(D_i, C) \\ &= \$9,000,000 / \{ [\$9,000,000/C + D15[(\$575/C)-255] + D16[(\$800/C)-255] + D16[(\$1000/C)-255] \} \end{aligned}$$

(See Figures 4 and 5)

NSub be the total subsidy provided to **NRED** for **NW**:

$$\begin{aligned} NSub(D_i, C) &= [(D15+D16+D17)*255*C] - [T\$(D_i)-\$9,000,000] \\ &= [(D15+D16+D17)*255*C] - [(\$575*D15)+(\$800*D16)+(\$1000*D17)] \\ &= D15(255C-\$575) + D16(255C-\$800) + D17(255C-\$1000) \end{aligned}$$

(See Figure 6 and 7)

Here are a few points about the Norman's pricing system worth noting:

(1) Given the connection fees adopted for **NRED** and possible costs for new water capacity, **CWC** end up with less water capacity than they could otherwise afford with their \$9 million budget, i.e., **CW** < \$9 million/**C**.

- \$9,000,000 supplies \$9,000,000/**C** in water capacity.
- $CW = \$9,000,000/C + D15[(\$575/C)-255] + D16[(\$800/C)-255] + D16[(\$1000/C)-255]$
- $C > \$4.00/\text{gd}$, so $D15[(\$575/C)-255] < 0$, $D16[(\$800/C)-255] < 0$, & $D16[(\$1000/C)-255] < 0$
- $\$9,000,000/C > CW$.

(2) Given the connection fees adopted for **NRED** and possible costs for new water capacity, **CWC** pays a higher effective price for water capacity than the cost of providing that capacity, i.e., **PC** > **C**.

- $PC = \$9,000,000/CW$
- $CW < \$9,000,000/C$ so $PC > \$9,000,000/(\$9,000,000/C) = C$.

(3) Given the connection fees adopted for **NRED** and possible costs for new water capacity, **NRED** receives a positive subsidy for new water capacity, i.e., **NSub** > 0.

$$- NSub = D15(255C-\$575)+D16(255C-\$800)+D17(255C-\$1000)$$

$$- C > \$4.00/gd, \text{ so } D15(255C-\$575) > 0, D16(255C-\$800) > 0, \text{ \& } D17(255C-\$1000) > 0$$

- The sum of 3 positive numbers is positive, so $NSub > 0$.

Conclusion

The City of Norman's mechanism for providing for new water capacity has new real estate development paying less on a per unit basis than current water customers. This mechanism was designed to improve the competitiveness of the Norman housing industry. It is clearly a subsidy. Among the implications of this subsidy, given the range of possible costs for new water capacity, are that current water customers will end up (1) with less water capacity than their monetary contribution could have purchased and (2) paying an effective price that exceeds the actual cost of new water capacity for whatever capacity they receive. Even at the low end of both the water cost and new demand spectra, the subsidy for new development will reach seven figures.

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<https://norman.legistar.com/LegislationDetail.aspx?ID=2072400&GUID=66A180FF-7A5C-4B62-AB74-0B021A8A90D3&Options=&Search=>)

Text File O-1415-16 (link here at Item 24:

<https://norman.legistar.com/LegislationDetail.aspx?ID=2072400&GUID=66A180FF-7A5C-4B62-AB74-0B021A8A90D3&Options=&Search=>)

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http://legistar1.granicus.com/normanok/meetings/2014/11/1272_A_City_Council_14-11-25_Meeting_Agenda.pdf)

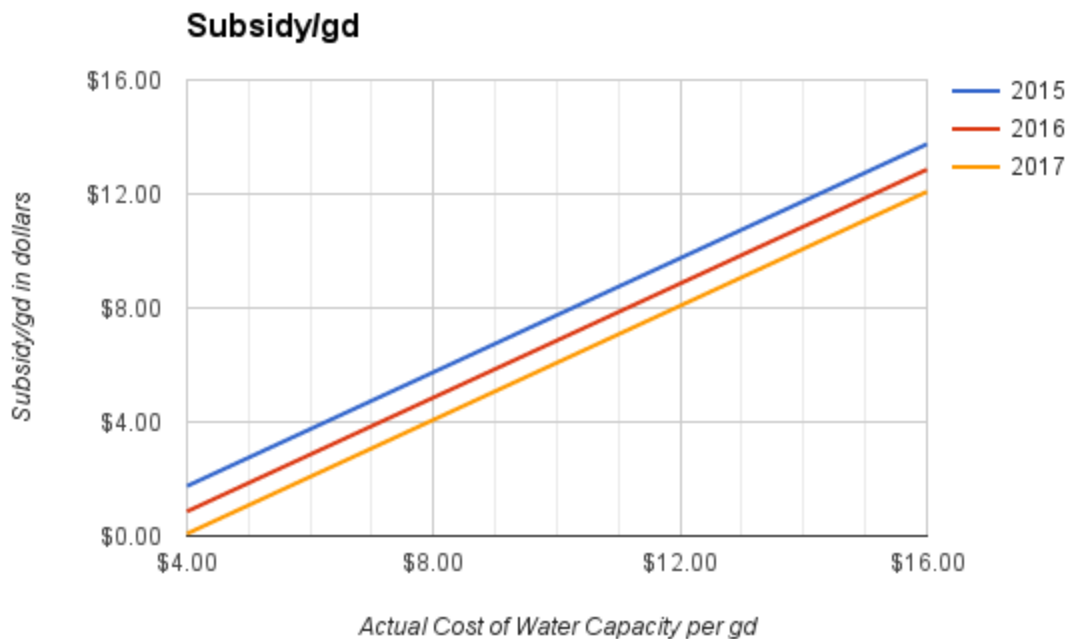


Figure 1

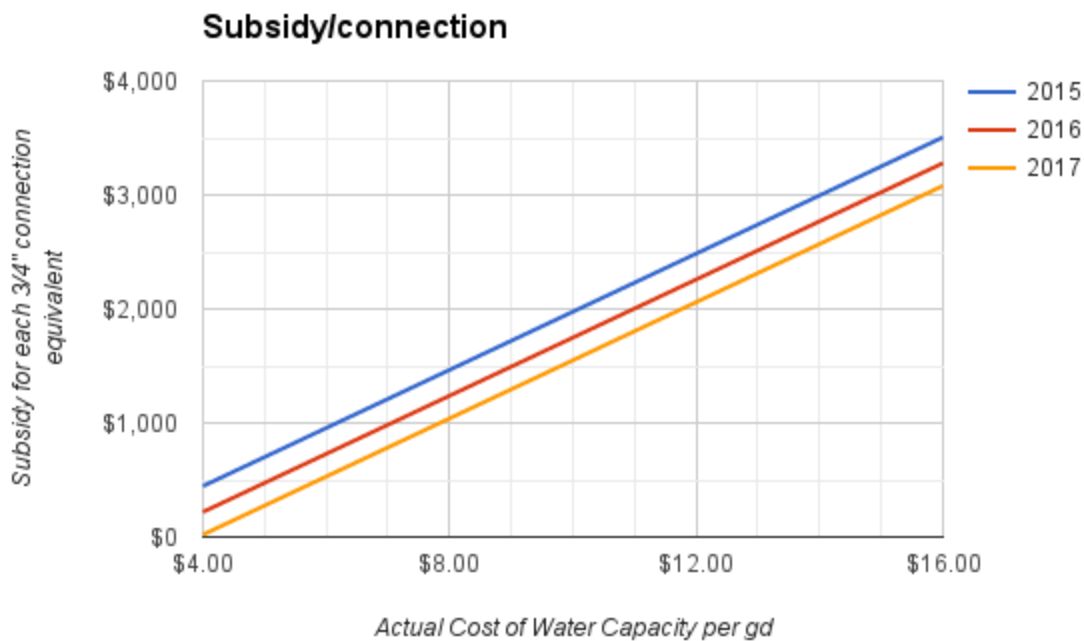


Figure 2

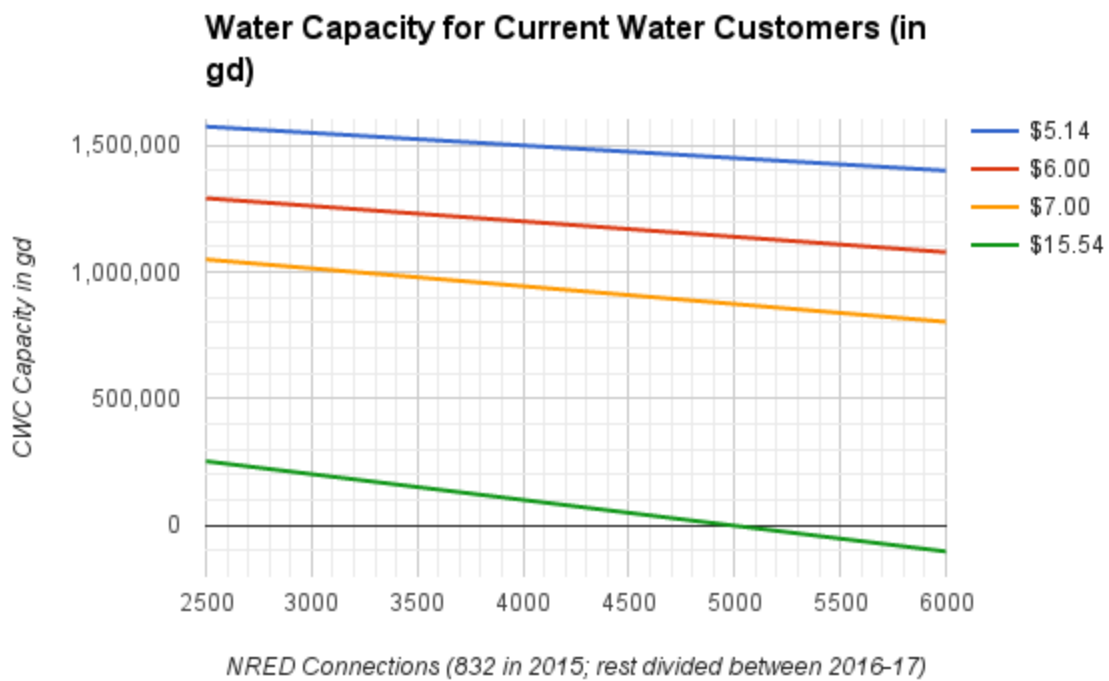


Figure 3

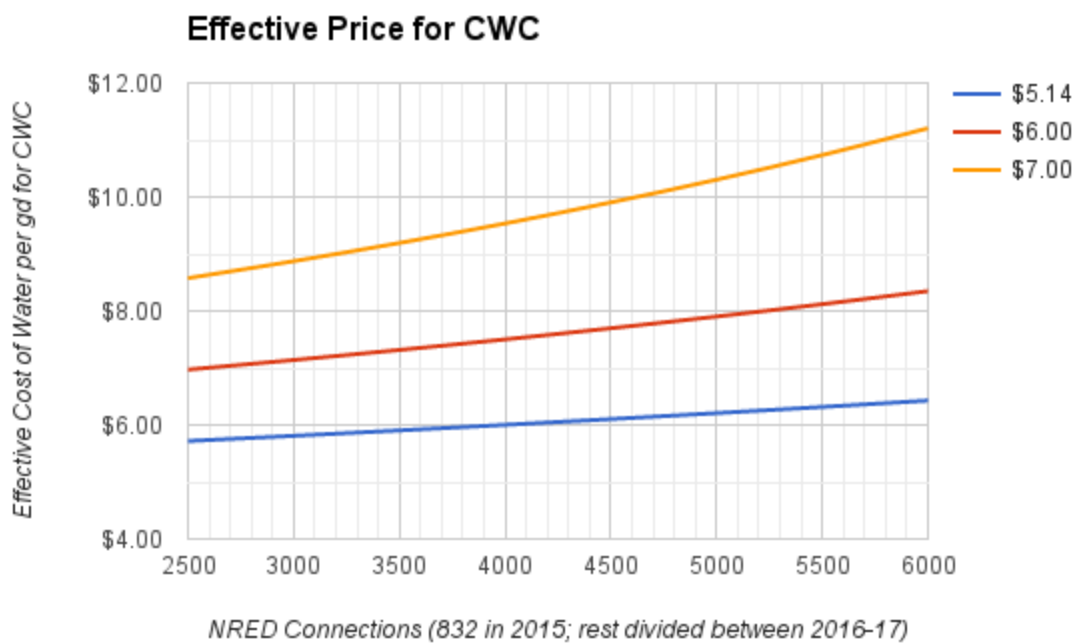


Figure 4

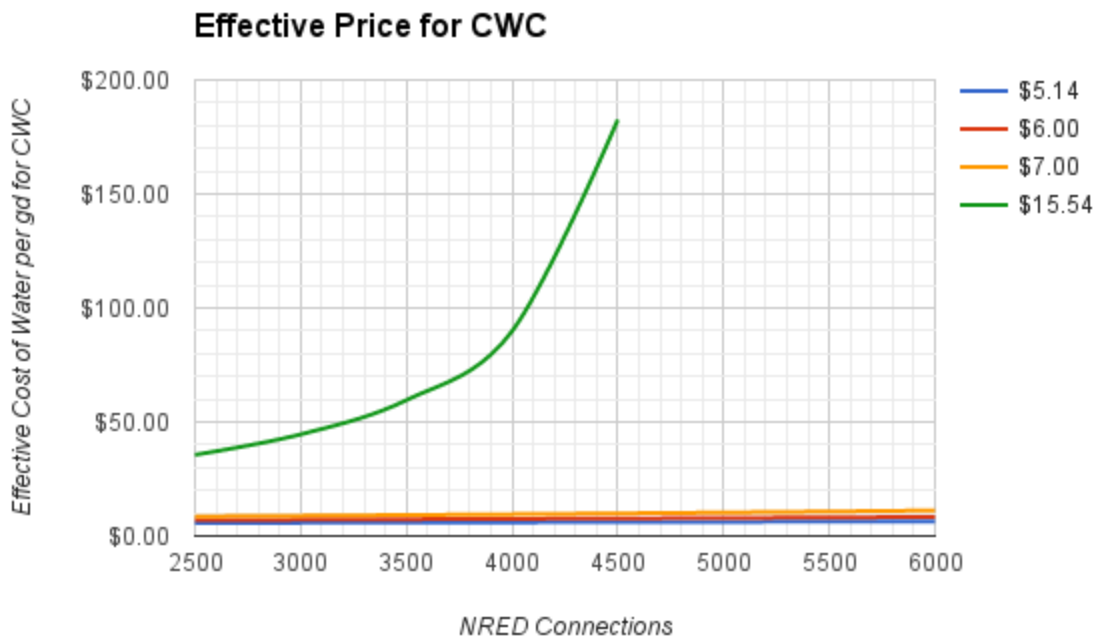


Figure 5

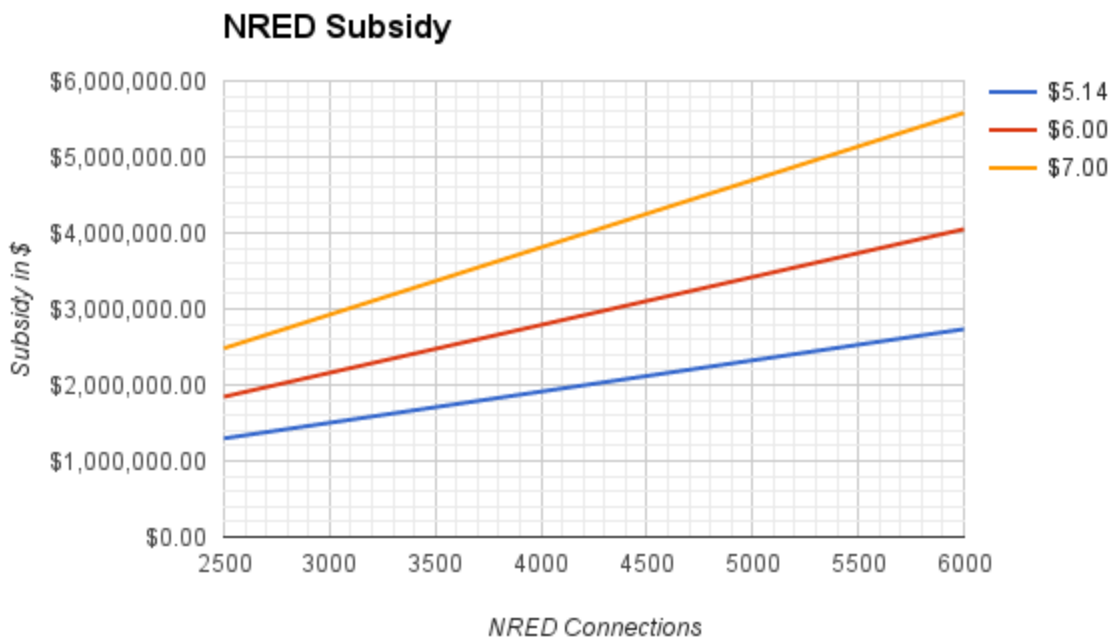


Figure 6

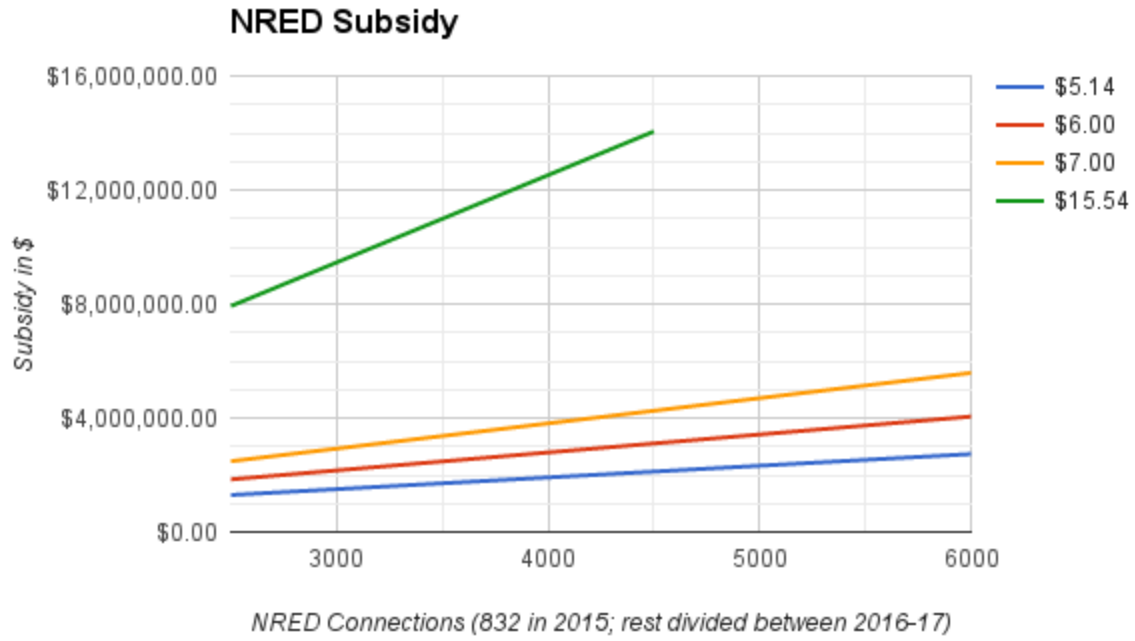


Figure 7