Name: [redacted] Date: 5-22-19

Wind and Solar Energy Analysis

In 2015, the City of Talent used approximately 37 GW of energy. Currently, 76% of the housing in Talent is single family detached, 19% multifamily, and 5% is single family attached. According to the Talent Clean Energy Action Plan, 71% of the energy needed is for residential use.

Based on your population growth projections, the City of Talent will need 5 GW of energy for residential use by the year 2030. The plan moving forward is to build 65% single family detached, 10% single family attached, and 25% multi-family.

In 2018, the City of Talent used 491,075 kWh of energy to power all of the City buildings, approximately 1.33% of the total energy used.

Table 1. City of Talent Energy Consumption Breakdowns

	Current	Projected	Totals
Residential	31,985,924.68 kWh	5,086,743.044 kWh	**37,072,667.72 kWh**
Single Family Detached	24,309,302.76 kWh	3,306,382.99 kWh	27,615,685.75 kWh
Single Family Attached	1,599,296.23 kWh	508,674.3 kWh	2,107,970.53 kWh
Multi-family	6,077,325.69 kWh	1,519,331.42 kWh	7,596,657.11 kWh
Commercial	4,523,000.32 kWh		**4,523,000.32 kWh**
Municipal	491,075 kWh		**20,773 kWh**
		Grand Total	**41,616,441.04 kWh**

Table 2. Single Family Detached Residential Annual Averages (Based on Class Solar Data)

Current Consumption	16,978.74 kWh	**Solar Capacity (kWh)**	10,696.81 kWh
Post Reduction Consumption	12,393.17 kWh	**% of Energy Generated by Solar**	93.5%

The average installation cost per single family resident would be $20,237.

Name: _____ Date: _____

Wind and Solar Energy Analysis

a) What size DC kW system would be needed to generate the kWh deficit using solar? (Use PVwatts to help you figure this out.) Do you have suggestions as to where solar farms can be constructed?

The DC kW system size would be 11,396

b) What would the cost be to install wind turbines (assume $3/watt)?

The cost would be $18,132,67,000

c) What would be the return on investment? (Use $0.056/ kWh)

16044225 ÷ 0.056
2.8650E8 ÷ 24
1,1437E7 ÷ 365
[32705.93 years]

4) How would you suggest that the energy that is used by commercial and municipal facilities be generated?

Middle
106,654
122,522
55,224
286200
114732
328932

640,258 kwh

Solar

Behind Colver
4,619,090 kwh/year

Two schools
640,258 kwh

5,259,318 kwh/year

El
76,347
86,426
64,750
80803
311,326

Wind

3 - 3m Orchard
5,812,650 kwh

3 - 3m back by wagner
5,812,650

Total Wind
11,625,300
5,259,348
16,884,648

I would suggest that the energy be generated by putting solar in both school parking lots also put solar on the elementry schools black top, the OSF building, and finally behind colver fields. I think Wind turbines should be placed in the back orchards in groups of 3 and 2 times and will get us 16,884,648 kwh