Putting it together: Grand Total

Including population growth, but not including per capita economic growth, after massive (nearly fivefold) efficiency improvements total 2050 energy demand is projected at around 36.86 quads. Total available potential supply equals ~37.7 quads, around 2% over requirements.

Electricity	
Hydroelectricity	2.84
Geothermal	0.20
Wind energy	As much as we can place
Natural gas + bio or waste gas for backup.	0.4-2.0
Solar thermal electric, photovoltaic, wave, electricity from biomass, other	As much as we can place
Additional wind & sun to make up transmission losses (omitted from total)	[1.36]
Land based biomass	*2.00-8.50*
Low temperature solar thermal	*6.47(or less)*
High temperature solar thermal	*1-2*
Total	**37.77**

As an additional margin of error, this scenario lowers our greenhouse gas production by more than 98-99% per capita - even with up to 5% of energy needs still being met directly by fossil fuel. If necessary we could provide a bit more from natural gas. Note that if we do manage to sustainably produce 8 quads of biofuels then we would need no fossil fuels.

As still another margin of error, this book was begun when oil was under $40 per barrel. To be conservative I assumed a $35 per barrel price. So, paybacks from efficiency measures in this book are now **very** conservative – meaning savings from efficiency would probably be greater than assumed.