solar for schools

SWITCH ENERGY ALLIANCE

Switch Film Question List — Level: Secondary

Instructions: Log into your Switch Energy Alliance account under https://switchon.org/ and select 'Films.' Scroll down to find the *Switch* movie and click 'Watch Film' to begin watching. Or you can view the full film on Youtube: https://www.youtube.com/watch?v=RvaE0PFna84

Answer the following questions about what you see in the film.

CHAPTER 1. INTRODUCTION: MAKING THE TRANSITION

1. In which country has the most successful energy transition taken place? What type of renewable energy do they mostly use?

2. What percentage of the electricity in the country comes from renewable resources?

3. What is Professor Tinker trying to figure out in this film?

4. List 4 things in Professor Tinker's life that use energy or need energy to work.

5. How many Watt-hours of energy does one person use in one year, on average?

CHAPTER 2. FOUNDATIONAL ENERGIES: COAL

6. What do we use coal for?

7. Where is the largest coal reserve in the world?

8. What volume of coal do they excavate from the site per year?

9. What percentage of global electricity generation comes from coal?

10. How much time do we have until we run out of coal?

11. Why does the world use so much coal to generate electricity?

12. What is the largest roadblock from making coal clean and carbon emissions capture?

CHAPTER 3. FOUNDATIONAL ENERGIES: OIL

13. What primarily do we use oil for?

14. Where is the price for oil determined?

15. What does the price for oil depend on?

16. What is so unique about gasoline and why is it so hard to replace?

17. How many barrels of oil does America use per day?

CHAPTER 4. POWERING GROWING NATIONS

18. What will be the largest populated country in the world?

19. What is the dilemma that developing countries, including India and China, face in the next few decades?

20. What makes up the largest proportion of our energy use?

CHAPTER 5. TRANSPORTATION OPTIONS: BIOFUELS

21. What is the fuel called that is produced from plants?

22. What are the negative aspects of using corn as a biofuel?

23. What parts of the plant should be used for producing biofuels?

24. What is the challenge for bioenergy?

CHAPTER 6. TRANSPORTATION OPTIONS: NATURAL GAS

25. What does CNG stand for?

26. What are the emissions from burning CNG?

27. What is needed to be able to use CNG in vehicles?

28. What types of vehicles do use/could use CNG?

CHAPTER 7. TRANSPORTATION OPTIONS: UNCONVENTIONAL OIL

29. What form of oil is found in at the oil sands and how is it extracted?

30. According to Professor Tinker, what will be the main replacement of oil and why?

CHAPTER 8. TRANSPORTATION OPTIONS: ELECTRIC CARS

31. What type of engines do we use in traditional vehicles?

32. Why are we not using more electric-powered vehicles?

33. What are the benefits of electrifying transportation?

34. How much more electricity do we need to generate if we electrify our transportation?

CHAPTER 9. ELECTRICITY OPTION: GEOTHERMAL

35. What percentage of Iceland's electricity comes from geothermal energy?

36. How do we generate electricity from geothermal energy?

37. What are the emissions from the geothermal power plant in Finland?

38. What is geothermal energy dependent on?

CHAPTER 10. ELECTRICITY OPTIONS: SOLAR

39. How many people does the average solar array provide electricity for per year?

40. How long is the payback on average for a solar panel system on a home?

41. What are the limitations of solar technology?

42. What do the towers in the solar thermal plant in Spain capture from the sun, heat or light?

43. True or false: Photovoltaic solar panels can utilize a broader range of sunlight in comparison to solar thermal towers.

CHAPTER 11. ELECTRICITY OPTIONS: WIND

44. How much of Denmark's electricity comes from wind power?

45. What are the benefits of wind power?

46. When do the wind turbines work?

47. What are the largest issues about making wind a large-scale power source?

CHAPTER 12. ELECTRICITY OPTIONS: NATURAL GAS

48. Is natural gas a fossil fuel?

49. How do we extract natural gas from rocks?

50. What are the positive aspects of using natural gas for energy?

51. What are the largest concerns about hydraulic fracturing?

52. What is the most important consideration about utilizing natural gas as a large-scale power source?

CHAPTER 13. ELECTRICITY OPTIONS: NUCLEAR

53. What is the largest concern about nuclear energy?

54. What is the role of water in the pool in the nuclear power plant?

55. What are the cost considerations of using a nuclear reactor to generate electricity in comparison to coal power plant?

56. How much of France's electricity comes from nuclear power?

57. France recycles spent fuels at the nuclear plant. What percentage of the spent fuel is Uranium and Plutonium, which is used for nuclear energy?

58. What are the biggest benefits of nuclear energy?

CHAPTER 14. MAKING THE SWITCH: THE VALUE OF EFFICIENCY

59. What is the biggest lesson Professor Tinker learned after his trip?

60. Review: What are the foundational energies?

61. What does Professor Tinker define as “energies of the future?”

62. When does the cross-over occur from foundational energies to “energies of the future?”

63. What does Professor Tinker say is the most important part of securing our energy future?

64. What are examples of increasing energy efficiency that we all can do?