Storyline recycling

Part 1: Introduction (approx.. 1 – 1,5 pages / 500 – 800 words)

1) Introduction
   a) Issue: waste management
      i) Waste management is important issue. Improper management can damage public health and/or environmental health. Also, it can contribute to climate change mitigation, for instance as green/bio-fuel source (I&M, 2010)
   b) Problem owner and problem: Ministry and national policy objectives
      i) In the Netherlands, the Ministry of Environment and Infrastructure is responsible for national waste management policy.
      ii) National waste management policy 2009 – 2021 ("Landelijk Afvalbeheer Plan 2) has been developed.
      iii) Priority order: "Lansink's Ladder" (see Wikipedia, 2012).
      iv) Official policy objective: 83% of waste recycled by 2015 (I&M, 2010)
   c) Means:
      Current policy measures (Milieu, 2011; Wiel, 2011; Hoogers, 2012):
      i) stimulating innovation and knowledge bundling, 'grondstofrotonde', involving municipalities, waste companies and producers
      ii) reduce red-tape (administrative burdens) for international waste transportation,
      iii) stimulating separated waste collection (e.g. public awareness campaigns).
   d) Complications:
      i) But: already high amount of waste recycling in Netherlands, more not easy.
      ii) Needs to stay within financial limits
      iii) Alternatives to recycling are currently very cheap (incineration and dump-sites). (Perree, 2011; Brbs, 2011). In fact, incineration plants "need" fuel.
      iv) Getting in more waste from abroad would help meet 'demand', but is not necessarily a desirable solution.
   e) Problem statement: How to increase amount of recycled waste without raising financial burden for Ministry of Infrastructure and Environmnet and without an increased reliance on foreign waste?
   f) Outline of issuepaper structure

Part 2: Problem Analysis (approx.. 6-8 pages / 3.500 words)

2) Competitiveness of recycling within waste management system
   a) Over-capacity in waste incineration plants is barrier for recycling objectives
      i) Three policy measures considered. All ("grondstofrotonde", reducing administrative barriers, stimulating separate waste collection streams) will in principle have positive effects on key objectives of the Ministry (more waste recycled, lower costs, limited dependence on foreign waste – see Rijksoverheid 2012 and Annex with Goal Tree). (based on Annex with causal relations diagram and system diagram)
      ii) However, effects of these measures are likely to be undone by the effect of the existing over-capacity in waste incineration plants in the Netherlands. This keeps costs of waste incineration low, meaning that recycling cannot compete with waste incineration as a destiny for waste. (based on Annex with causal relations diagram and system diagram, backed mainly by Perree, 2011)
   b) Instruments to increasing the competitiveness of recycling

i) Addressing current dynamics in waste management system can be done by targeting the factors currently associated with the overcapacity in waste incineration plants.
ii) Instruments that the Ministry could use: introduce a tax on waste incineration (to affect current low price of waste incineration), reintroduce tax on dumping waste, introducing a subsidy for recycling, force incineration plants to close (legal measure), introduce (strict) laws and regulations on waste recycling, and heighten the existing import cap for foreign waste (Perree, 2011; I&M, 2010).
iii) However, these measures will help to increase the position of recycling vis-à-vis incineration (and dump-sites), but will also have negative consequences. Related to costs, dependency on foreign waste, or opposition from other parties.

3) Longer term approach needed (>2015)
An effective policy to increase recycling in the future requires a longer-term approach, for instance to be able to shut down certain existing waste incineration plants
a) Looking into incineration plant closure
i) Achieving recycling goals of 83% of waste being recycled, roughly requires an increase of 1.5 million tons of waste per year (Milieu, 2011). Current over capacity in waste incineration plants is estimated at 1 million tons per year (Nuzakelijk, 2012). Further reducing waste for incineration with 1.5 million tons thus seems difficult.
ii) It will run into protests from plant operators and municipalities.
iii) Incineration plants are run by independent organizations, whose closure cannot simply be 'ordered'. Furthermore, the Ministry and its Deputy-Minister have already signaled they do not want to order closure of plants, but consider this an issue that needs to be resolved by the market, as these are private organizations (Harlingen, 2012).
iv) They find strong allies in municipalities, who are currently responsible for waste collection in their municipalities, who benefit from the low costs associated currently with incineration and dumping. Many municipalities have long-term running contracts with waste incinerators, and/or have invested in a heating network for city heating using the heat generated by waste incinerators.
v) This last aspect shows that waste incineration also provides a source of 'green' energy production, something that is also of interest to (other parts of) the Ministry of Infrastructure and Environment.
b) Using imports of waste as long-term strategy
i) Waste incinerators could be 'fed' by import of waste, as currently the Netherlands and Germany offer the lowest prices for waste incineration in the EU (Persson, 2012). On the longer-term this seems a difficult strategy, because the supply of (cheap) foreign waste is likely to reduce in the future, as countries as Poland, Cyprus, Bulgary are likely to create their own facilities (AgentschapNL4, 2012; Defra, 2011).
c) Towards long-term reduction in waste incineration capacity
i) Difficult as it may seem, closing incineration plants in the future seems inevitable., and leaving it purely to the market may result in an undesirable competition and race-to-the-bottom between incineration plants.
ii) Closure of plants cannot be ordered, but there are certain conditions that need to be met to reduce opposition from other parties against closure: plants older than 20 years (average time to recover investments, AgentschapNL2, 2011); no running contracts with munipalities for waste disposal; no contracts/integration in local heating networks.
iii) Currently, none of the plants will meet all these requirements, and therefore, short-term measures are needed as well.

4) On short term (2015) temporary measures should be taken
   a) Introducing taxes will encounter opposition and effect is limited as waste will simply travel to Germany, which also has low prices.
   b) Subsidies introduce financial burden, as subsidies need to be considerable in order to be effective (see Perree, 2011; Hoogers, 2012).
   c) Most promising measures on short term are increase in import cap, allowing more imprts of waste, and reducing the administrative burdens associated with imports. This increases dependency on foreign waste, but as a short measure that may be acceptable. Note that effect is likely to be positive, but not sure if it will be sufficient to realize the 83% target.

5) Finally: consider reflection on current policy objectives
   a) Current policy target based on waste management 'ladder', which prioritizes recycling over waste incineration. Current 83% target is motivated also by European regulation, but the idea is to stimulate recycling, as proper 'use' of waste, and the generation of waste. Strict 83% target may be unnecessary limiting. Is current target and 'waste ladder' prioritization still applicable when waste incineration provides a 'green' form of energy supply?

6) Conclusions (recap) and Knowledge gaps
   a) Recycling targets difficult to realize. Requires measures to address overcapacity in waste incineration plants, which are only feasible on longer term.
   b) Furthermore, decision on these longer-term strategies requires that several knowledge gaps are being addressed. Among others:
      i) What are the alternative 'green' energy sources in the coming 20 – 50 years?
      ii) What is the dependency of municipalities on waste incineration plants due to coupled city heating infrastructure?
      iii) What is the time needed for waste incineration plants to recover past investments?
      iv) What incineration capacity remains needed to dispose of waste that cannot be recycled?

Part 3: Research Proposal (approx. 2 pages, 700 – 1000 words)

7) Research proposal
   a) Research question: What are the critical factors in facilitating a transition towards (nearly) complete recycling in the Netherlands?
   b) Research method: System Dynamics
      i) Elaborate the model around the observed feedback loops, to get a better understanding of system behavior, and factors that are influential in facilitating a change towards positive developments
      ii) Method proposed is system dynamics, useful to understand system behavior and influence of factors and relations on longer-term developments. System to be studied includes important feedback loops and has clearly recognizable "stocks-and-flows" in waste materials.
      iii) Key factors include those involved in the feedback loops that drive system behavior (see system diagram/causal relations diagram).
      iv) Data available from? *Check possible sources!!*
   c) Planning: indication of planning, staying within time limit of 2 months.

   d) (Alternatively Cost-effectiveness analysis could be proposed, tackling question of what plants to prioritize/schedule for closure in future. Taking into account several factors for existing plants (size, past investments, linkage to heating infrastr, , suitability types of waste, …)

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Annexes not included in this example (detailed analyses)